

MISS L. E. CHEESMAN'S EXPEDITIONS
TO NEW GUINEA

TRICHOPTERA



BY

D. E. KIMMINS

British Museum (Natural History) *xyj*

Pp. 97-187 ; 74 Text-figures

BULLETIN OF
THE BRITISH MUSEUM (NATURAL HISTORY)
ENTOMOLOGY

Vol. 11 No. 4

LONDON: 1962

THE BULLETIN OF THE BRITISH MUSEUM (NATURAL HISTORY), instituted in 1949, is issued in five series corresponding to the Departments of the Museum, and an Historical series.

Parts will appear at irregular intervals as they become ready. Volumes will contain about three or four hundred pages, and will not necessarily be completed within one calendar year.

This paper is Vol. II, No. 4 of the Entomological series. The abbreviated titles of periodicals cited follow those of the World List of Scientific Periodicals.

© Trustees of the British Museum, 1962

PRINTED BY ORDER OF THE TRUSTEES OF
THE BRITISH MUSEUM

Issued 13 February, 1962

Price Thirty Shillings

MISS L. E. CHEESMAN'S EXPEDITIONS TO NEW GUINEA

TRICHOPTERA

By D. E. KIMMINS

SYNOPSIS

This paper is based upon material collected by Miss L. E. Cheesman, 1933-34, 1936 and 1938. Fifty-one new species are described, in nine families, and keys are given to the Papuan species of the genera *Chimarra*, *Polycentropus*, *Oecetis* and *Triaenodes*.

THE greater part of the material upon which this paper is based was collected by Miss L. E. Cheesman on her expeditions to New Guinea in 1933-34, 1936 and 1938, to which has been added such other unidentified material in the British Museum from New Guinea. Some explanation is due for the long delay in working out these collections, which were received by the British Museum before the war by my late colleague Mr. M. E. Mosely. He was proposing to work on them but on hearing from Dr. G. Ulmer of his work on a large collection of Trichoptera from the Lesser Sunda Islands, Mosely decided to put the Papuan material on one side until the completion of Dr. Ulmer's work. The war delayed the publication of Ulmer's papers and Mosely died before they were completed.

Miss Cheesman was not in any way specialising in the collection of Trichoptera, but in spite of this, she has succeeded in bringing the total of species for New Guinea up to eighty-six, of which some fifty are here described as new to science. This number is probably only a fraction of the total fauna, since comparatively little work has been done on the Trichoptera of this area, and consequently it is not surprising that many species *appear* to be endemic. In our present state of knowledge, one cannot say much about the origin of the Papuan Trichopterous fauna, other than that there are affinities with the faunas of Australia, Solomon Islands, Fiji, Borneo and the Sunda Islands.

The author would like to express to Miss Cheesman his thanks for the opportunity to work on this material. The types of all new species are deposited in the British Museum (Natural History) and all material was collected by Miss Cheesman unless otherwise stated. Names of species not collected by Miss Cheesman are enclosed within square brackets.

Family RHYACOPHILIDAE
Subfamily HYDROBIOSINAE

Percivalia papuana sp. n.

(Text-figs. 1-2)

PAPUA: Mt. Tafa, 8,500 ft., iii. 1936, 1 ♂, 2 ♀.

♂. General colour fulvous, with sparse fuscous hairs on head and thorax. Eyes black. Wings of holotype rather denuded. In the fore wing, cell R_2 has a short footstalk, cell R_4 sessile. Discoidal cell closed. In the hind wing cells R_2 , R_4 , M_1 , and Cu_{1a} all with footstalks.

♀. Wings pale fuscous, with upstanding fuscous and golden hairs on the veins of the fore wing. The marginal fringe of the latter is fuscous, with golden spots on the apices of the veins. Venation much as in male.

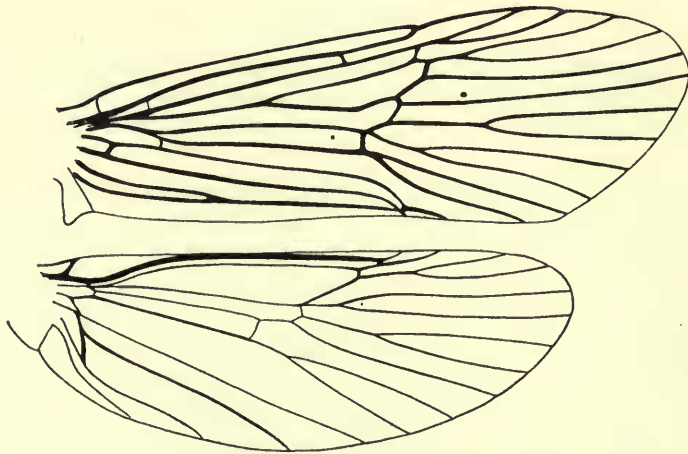


FIG. 1. *Percivalia papuana* sp. n. ♂ Wings.

♂ GENITALIA. Fifth segment with short lateral filaments. There is a long, slender ventral process on the sixth segment but the seventh is practically unarmed. The ventral process of the sixth segment terminates in a few small, black, peg-like teeth. Ninth segment short, its ventral margin excised at its centre. The tenth segment is fused to the ninth, extending as a moderately elongate, narrow tube. Cercus small and rounded. Paracercus short and bifid. Filicercus long and slender, slightly clavate at its apex. Aedeagus short, cylindrical, its base encircled by a sclerotized sleeve, whose lower apical margin projects downwards on each side of the aedeagus in a flattened claw. Clasper about as long as tenth segment, narrowed a little at its base, in side view with its lower margin dilated before the apex, which is excised in ventral view.

♀ GENITALIA. A long, slender ventral process, terminating in black, peg-like teeth, on the fifth abdominal segment and a short, pointed process on the sixth. Seventh sternite with its apical margin in side view produced in a rounded lobe. Eighth segment partially divided into tergite and sternite, the tergite overlapping the sternite. Ninth tergite with its lower apical

angles produced in rounded lobes, its sternite more or less fused to apex of eighth. Tenth segment represented by a pair of small, rounded plates, each carrying a two-segmented cercus, terminal segment minute. In the allotype there is a pair of membranous fingers below the

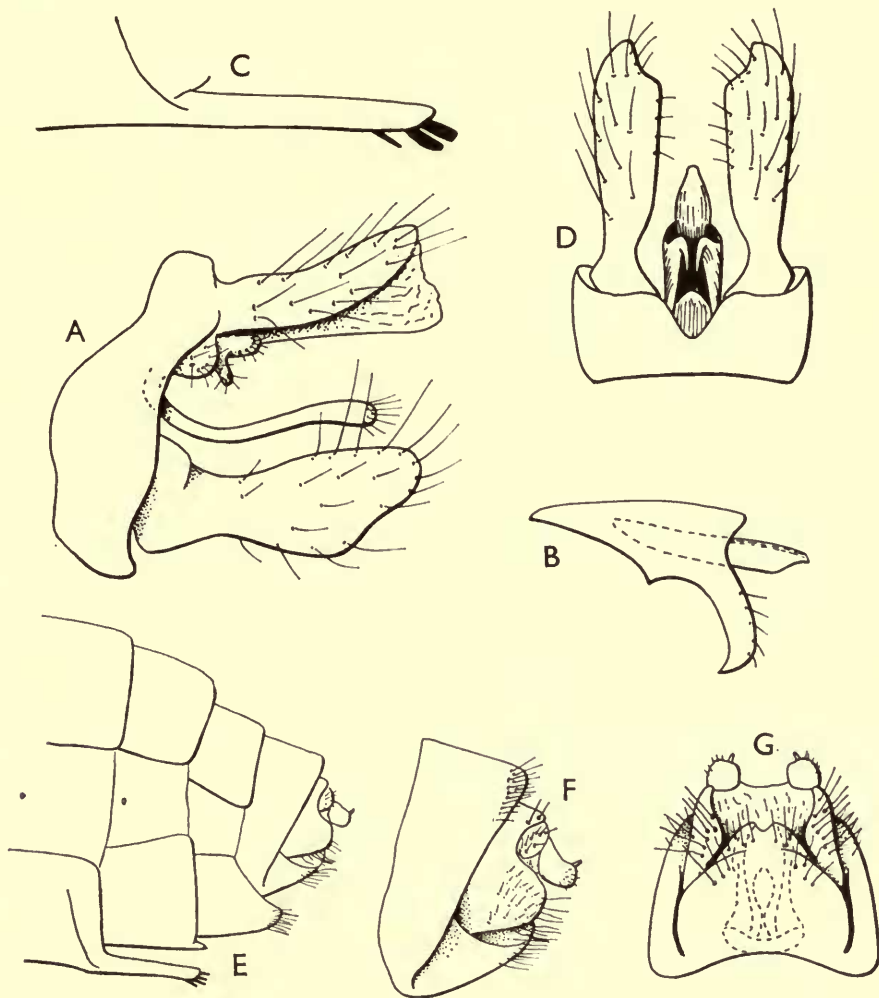


FIG. 2. *Percivalia papuana* sp. n. Genitalia. A, ♂, lateral; B, ♂, aedeagus, lateral; C, ♂, ventral process of sixth abdominal segment, lateral; D, ♂, ninth segment, claspers and aedeagus, ventral; E, ♀, fifth to tenth abdominal segments, lateral; F, ♀, eighth to tenth segments, lateral; G, ♀, eighth to tenth segments, ventral.

cerci, possibly accidentally extruded, which are not figured. Internal structure indistinct, semi-membranous, its shape indicated in the ventral view.

Length of fore wing, ♂, 10 mm., ♀, 11 mm.

♂ HOLOTYPE pinned, abdomen in glycerine, one pair of wings mounted dry, ♀ allotype pinned, abdomen in glycerine, and ♀ paratype. I was at first inclined

to place this species in *Taschorema*, which it resembles in the form of the male genitalia, but the absence in the male of a scale-patch in the cubito-anal area of the hind wing, the presence of a footstalk to cell R_4 in the same wing and the absence of a ventral process to the seventh abdominal segment all suggest *Percivalia*. It differs from other species of *Percivalia* (= *Notiobiosis* Mosely partim) in the presence of short lateral filaments to the fifth segment. I am unable to say whether there are any eversible scent-organs between the second and third abdominal segments, as this area was damaged in the holotype.

Family GLOSSOSOMATIDAE

Subfamily GLOSSOSOMATINAE

Synagapetus ulmeri Ross

PAPUA : Kokoda, 1,200 ft., vii-ix. 1933, 38 ♂.
Previously recorded from New Guinea.

Synagapetus sp.

PAPUA : Kokoda, 1,200 ft., vii-ix. 1933, 86 ♀.

It is probable that the majority of these females are *S. ulmeri* Ross, but as there are two males of another species from the same locality, it seems unwise to determine them specifically.

Synagapetus jafiwi Ross

DUTCH NEW GUINEA : Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 8 ♂, 12 ♀; Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂.
Previously recorded from New Guinea.

Synagapetus productus sp. n.

(Text-fig. 3)

PAPUA : Kokoda, 1,200 ft., ix. 1933, 2 ♂.

General colour dark fulvous, head and thorax with pale golden hairs. Antenna stout, ochraceous at its base, becoming fuscous towards the apex. Eyes black. Palpi fuscous. Legs fulvous, with fuscous spurs. Wings pale fuscous, anterior with a darker fuscous patch at the base of the stigma, pubescence fuscous.

♂ GENITALIA. In general pattern resembling *S. jafiwi* Ross. There is a strong, slender process to the sixth sternite. Tenth segment long, extending beyond the apex of the clasper. It consists of a pair of thin, convex plates with membrane between them, in side view tapering to an obliquely truncate apex, which carries an acute, outwardly and basally directed tooth. Lower margins of tenth segment sinuous in side view, curving inwards and overlapping each other beneath the aedeagus. Cercus short, narrow, laterally compressed and slightly down-curved. Aedeagus long and slender, bearing a pair of asymmetric spines at its base, one slender, the other flattened and sinuous. There is a finger-like projection about half-way and within are two short, curved spines. Clasper moderately long, in side view tapering and curving up-

ward from a broad base to a rounded apex. From beneath, it is straight, diverging and slightly tapering. The outer apical angle ends in a short finger and there is a small black tooth on the inner margin just before the apex.

Length of fore wing, 3 mm.

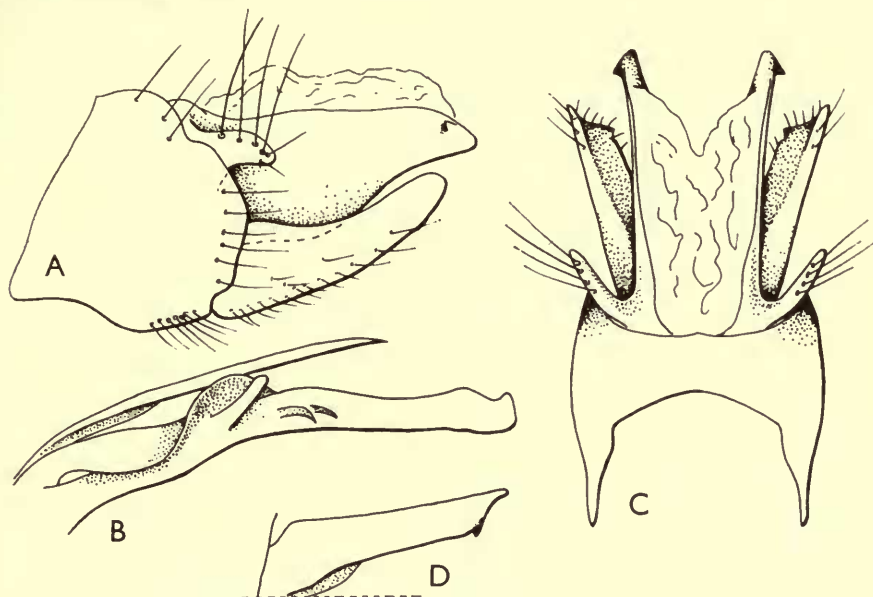


FIG. 3. *Synagapetus productus* sp. n. ♂ Genitalia. A, lateral; B, aedeagus, lateral; C, dorsal; D, left clasper, ventral.

♂ HOLOTYPE pinned, ♂ paratype, from which the illustrations have been made, lacking one fore wing and one hind wing, abdomen in glycerine. This species is closely related to *S. jafwi* Ross. It differs from that species in the more elongate, tapering tenth segment, which exceeds the claspers, and in the narrower cercus.

Family HYDROPTILIDAE

Orthotrichia obscura sp. n.

(Text-fig. 4)

PAPUA: Kokoda, 1,200 ft., ix. 1933, 1 ♂.

The pinned example was badly rubbed and has been made into a microscope preparation. All that can be said of its general appearance is that it was brownish. Antennae incomplete. In the fore wing, R_3 arises from R_2 in the normal manner.

♂ GENITALIA. Sixth segment with a short, acute ventral process. Tenth segment semi-membranous, fused to the ninth and somewhat asymmetric. Aedeagus with apex broken off in the holotype, probably long and slender. There is a curled spine arising about midway, directed caudad but direction may be variable. Alongside the aedeagus is a short, stout, sinuous spine, directed caudad. Claspers fused beneath to make a trapezoidal plate, tapering from base to apex in ventral view, slightly upcurved in side view. From beneath, the apex is

sinuously excised. At the base of the fused claspers, on the upper surface, is a trilobed plate, extending basally in a long, slender apodeme. The outer lobes are transparent, stout and digitate, each armed with a terminal bristle. The median lobe is more sclerotized, forming an arched, spatulate plate, longer than the side lobes. Apical margin of the ninth sternite with a quadrate excision at the centre.

Length of fore wing, ♂, 2.7 mm.

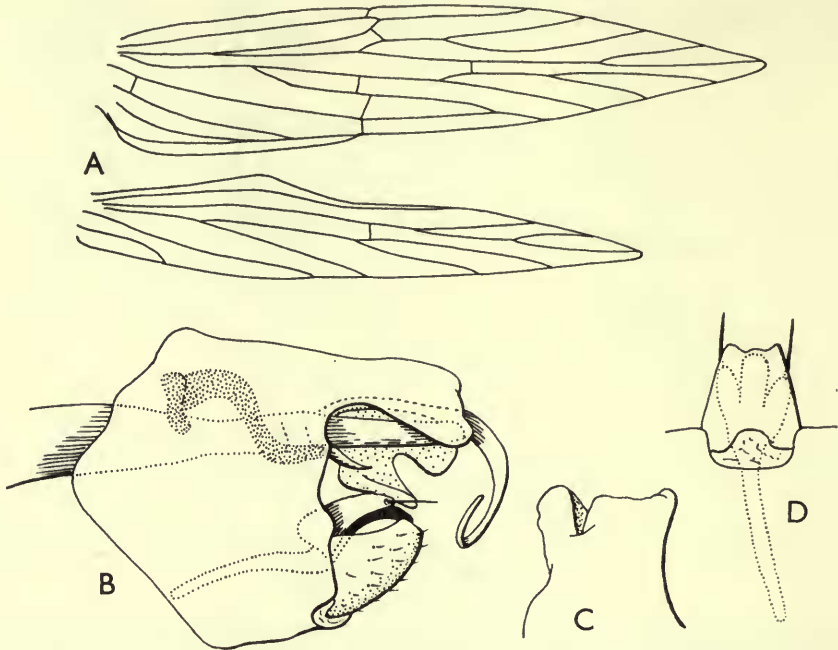


FIG. 4. *Orthotrichia obscura* sp. n. ♂. A, wings; B, genitalia, lateral; C, tenth segment, dorsal; D, claspers, ventral.

♂ HOLOTYPE mounted as microscope preparations, one hind wing missing. This species differs from *O. kokodana* sp. n. in the more completely fused, trapezoidal claspers, the shorter, sinuous spine alongside the aedeagus, R_3 arising from R_2 in the fore wing and Cu_1 unforked in the hind wing.

Orthotrichia kokodana sp. n.

(Text-fig. 5)

PAPUA: Kokoda, 1,200 ft., viii.1933, 1 ♂.

The pinned example was badly rubbed and all that can be said of its general appearance is that it was fuscous, with pale golden hairs on head and thorax. The antennae are incomplete. In the fore wing, R_3 arises from the stem of R_{4+5} and in the hind wing, Cu_1 terminates in a small fork.

♂ GENITALIA. Sixth sternite with a small, acute ventral process. Ninth segment somewhat asymmetric, tenth segment fused to it, short, with a small excision on the left side, partly

separating it from the ninth. Aedeagus very long and slender, with a basally directed spiral tube encircling it about midway. Alongside the aedeagus is a long spiral spine, its apex projecting beyond the ninth segment. Claspers small, fused, in ventral view with their outer apical angles produced in short, blunt fingers. Above their fused bases arises a bilobed structure, each lobe carrying a single bristle, the structure extending basally in a long, slender apodeme.

Length of fore wing, ♂, 2.7 mm.

♂ HOLOTYPE mounted as a microscope preparation. At first I thought that this species would require a new genus, based upon the difference in venation from the

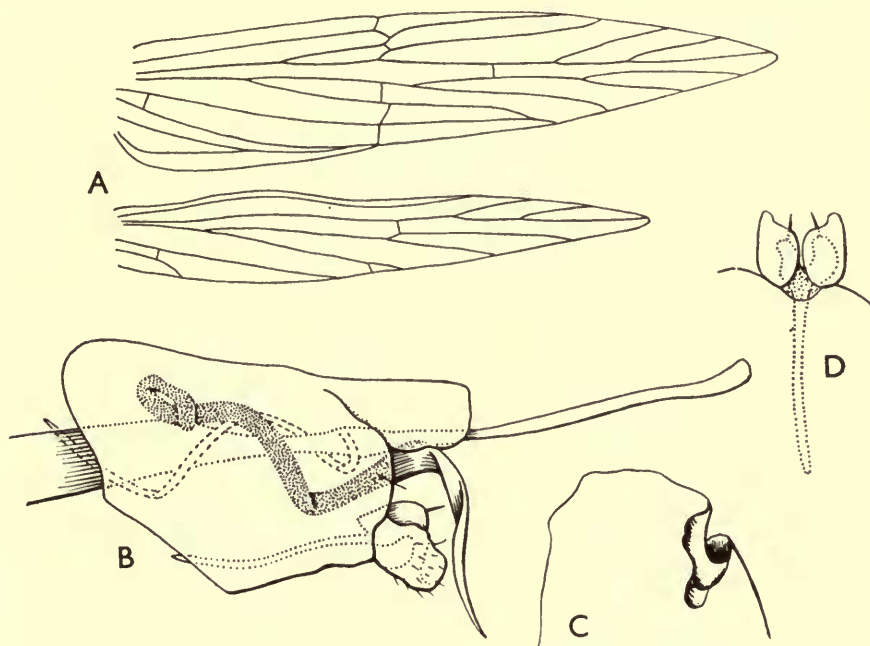


FIG. 5. *Orthotrichia kokodana* sp. n. ♂. A, wings; B, genitalia, lateral; C, ninth and tenth tergites, dorsal; D, claspers, ventral.

typical *Orthotrichia* wing. The male genitalia, too, are less asymmetric than is usual in this genus. Examination of other non-European species of *Orthotrichia* revealed that *O. moselyi* Tjeder from Anglo-Egyptian Sudan and *O. sanya* Mosely from Lake Nyasa both showed venation agreeing with *O. kokodana*, both have black scales on the costa of the fore wing and both have fairly asymmetric genitalia typical of *Orthotrichia*. I attach more importance to the similarity of the male genitalia than to the difference in venation, especially in such insects as the Hydroptilidae, where the narrowing of the wings has made the interpretation of the veins very much a matter of opinion at times. In Ulmer's key to the Hydroptilidae of the Sunda Islands, this species runs out to *Javanotrichia* but differs in having M_{1+2} in the hind wing not attached to R_{4+5} .

There is a single female from the same locality, dated vii. 1933, which may belong to this species. In the fore wing, R_3 arises from the stem of R_{4+5} . With so little material I shall do no more than mention it.

Hydroptila bispina sp. n.

(Text-figs. 6-7)

PAPUA: Kokoda, 1,200 ft., ix. 1933, 32 ♂.

General appearance dull ochraceous, fore wing pale fuscous, with patches of ochraceous pubescence. Head with the usual pyriform scent-organ caps, within which (in a cleared example)

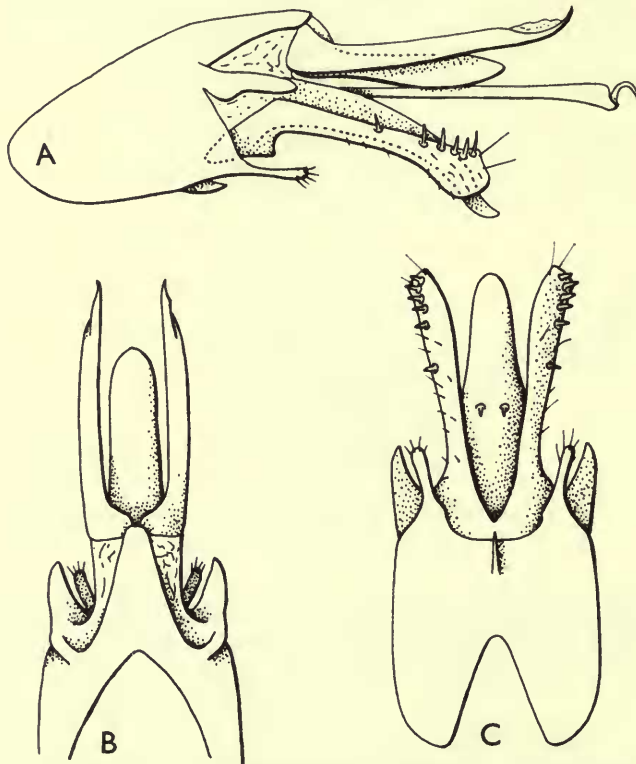


FIG. 6. *Hydroptila bispina* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth sternite and claspers, ventral.

can be seen a small, membranous scent-organ. Antennae with about thirty-five segments. Venation typical of *Hydroptila*.

♂ GENITALIA. Seventh segment with a small, acute ventral process. Ninth segment excised laterally, with a digitate side-piece arising from the base of the excision. In dorsal view, this side-piece is triangular. Ventral apical margin of segment produced on each side in a slender finger. Ventral surface of segment bears a small, acute, keel-like process. Tenth segment elongate, trilobed, median lobe rounded apically, lateral lobes spiniform, longer than median, apices slender and slightly upcurved. Aedeagus long and slender, with a small, terminal hook.

Claspers elongate, narrow, in side view each somewhat clavate apically, upper margin armed with peg-like teeth. Arising above the bases of the claspers is a tapering plate, about as long as the claspers and bearing two teeth on its lower surface.

Length of fore wing, ♂, 2.3 mm.

♂ HOLOTYPE mounted as microscope preparation. This species is related to *Hydroptila triloba* Kimmins (Guadalcanal) in the general structure of the male genitalia. It may be distinguished by the longer, spiniform lateral lobes of the tenth segment and the narrower, clavate claspers.

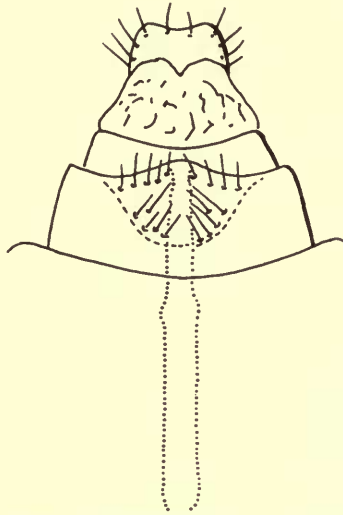


FIG. 7. *Hydroptila ?bispina* sp. n. ♀ Genitalia, ventral.

Amongst a number of female Hydroptilidae from Kokoda are four examples of a *Hydroptila*, which may well be the female of *H. bispina*. There is a distinctive subgenital plate on the eighth sternite, apical margin triangularly produced, basal margin indicated by a thickened line in the chitin, broadly rounded. The subgenital plate is set with bristles and it covers a long, slender tube, extending basally.

Family PHILOPOTAMIDAE

This family is represented in Miss Cheesman's collection by fifteen males and a number of females, belonging to the genus *Chimarra*. This genus is proving to contain a large number of species and the Papuan region is no exception, since these fifteen males belong to no less than nine species, all of which appear to be undescribed. Some of the species appear to be closely allied and since two stations in the Cyclops Mountains have produced seven species, it has not been found possible to associate females with males with any certainty. One species had already been described from New Guinea by Navás but I have not been able to identify his species with any of those collected by Miss Cheesman.

KEY TO MALES OF *Chimarra* SPECIES FROM NEW GUINEA

- 1 In hind wing, R_2 and R_3 remain fused. Ninth segment produced dorsally in two strong processes ***cyclopica* sp. n.**
- In hind wing, R_2 and R_3 separate. Ninth segment not so produced 2
- 2 In fore wing, R_s arises distinctly basad of base of thyridial cell, which is itself distad of intercubital cross-vein (acc. to Navás' figure) ***loriana* Navás**
- In fore wing, R_s arises at or distad of base of thyridial cell, which is basad of intercubital cell 3
- 3 Ventral process of ninth segment forming a slender finger, clavate in side view. Loop of $2A$ in hind wing incomplete 4
- Ventral process shorter, triangular in side view, keel-like. Loop of $2A$ in hind wing complete 6
- 4 Clasper in side view quadrate, about one and a half times as long as broad, its upper apical angle extended in a long, slender finger ***papuana* sp. n.**
- Clasper more elongately quadrate, with a short apical finger, or else gradually tapering from base to apex 5
- 5 Clasper in side view parallel-sided for most of its length, upper apical angle terminating in a short, curved finger ***schmidi* sp. n.**
- Clasper in side view tapering from base to apex, abruptly angled downwards shortly before apex ***sabrona* sp. n.**
- 6 Lateral lobes of tenth segment divided into an upper and a lower portion 7
- Lateral lobes not so divided 8
- 7 Lower branch of lateral lobe deep, convex ventrally. Clasper elongate, gently incurved ***cheesmanae* sp. n.**
- Lower branch narrow, straight ventrally. Clasper shorter, strongly incurved ***ulmeri* sp. n.**
- 8 Clasper in side view slightly upcurved, not sinuate 9
- Clasper in side view sinuately curved ***sinuata* sp. n.**
- 9 Lateral lobe of tenth segment from side with an irregularly excised upper margin. Clasper with a single, acute apex ***falcata* sp. n.**
- Lateral lobe of tenth segment from side with convex upper margin. Clasper with bifid apex ***kokodana* sp. n.**

***Chimarra cyclopica* sp. n.**

(Text-figs. 8–9)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 2 ♂; Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 3 ♂.

General appearance fuscous. Fore wing with cells R_2 and R_4 sessile, cell M_1 about as long as its footstalk, cell Cu_{1a} with a short footstalk. R_s sinuous, with a thickening before the discoidal cell, veins at base of discoidal cell also thickened. Median cell long. In hind wing, Sc and R_1 contiguous or fused, veins R_2 and R_3 fused (cell R_2 absent), cell R_4 sessile, cell M_1 about half as long as its footstalk, cell Cu_{1a} with a short footstalk.

♂ GENITALIA. Segment eight with tergite and sternite more or less fused, the sternite with a ventral process. Ninth segment also with a pointed ventral process. The dorsal apical margin is produced in a pair of spatulate processes, their apices slightly out-turned in dorsal view, gradually tapering in side view. From beneath their bases arise the lateral lobes of the tenth segment. Each lobe takes the form of a plate, set on edge, about as long as the process of the ninth segment, moderately deep, with an obliquely truncate apex in side view. The lobe is concave on its

interior surface and from above the apex is rounded. The upper margin has a triangular tooth near its base and there is another, much smaller, tooth on the apical margin. Median lobe membranous. It is possible that what have been termed processes of the ninth segment may be

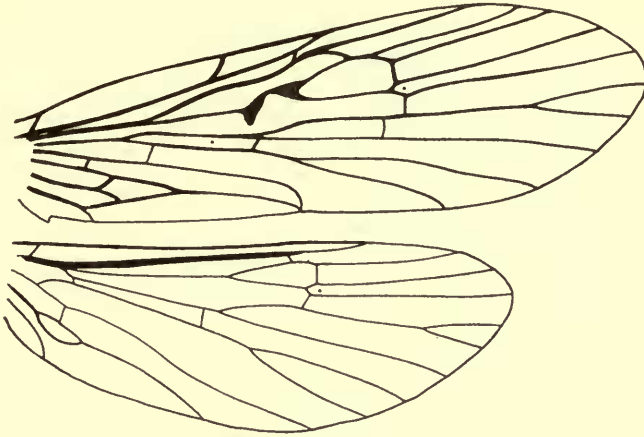


FIG. 8. *Chimarra cyclopica* sp. n. ♂ Wings.

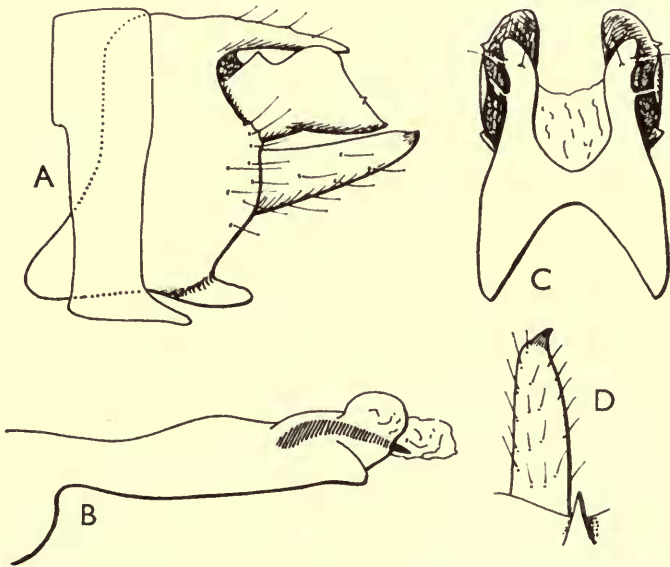


FIG. 9. *Chimarra cyclopica* sp. n. ♂ Genitalia. A, lateral; B, aedeagus, lateral; C, ninth and tenth segments, dorsal; D, left clasper, ventral.

part of the tenth segment, but they appear to be rigidly attached to the ninth, whereas the lateral lobes have some degree of movement. Aedeagus long, slender, with a bulbous base. The apex contains a single black spine. Clasper set just below the mid-lateral line of the segment, extending beyond the lateral lobes of the tenth segment, narrow and tapering in side view from base to

apex. In ventral view, they are parallel-sided for their basal two-thirds, then tapering to a blackened point.

Length of fore wing, ♂, 4.2 mm.

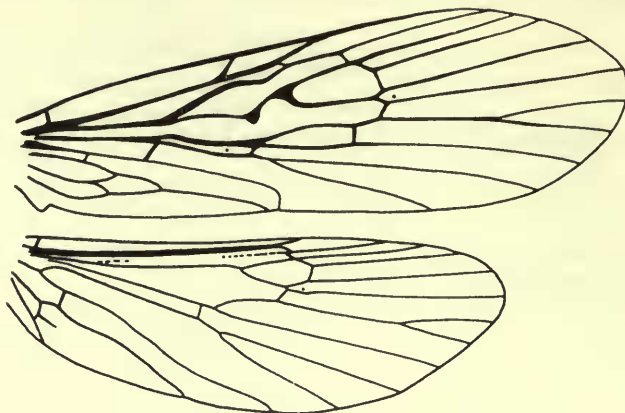


FIG. 10. *Chimarra papuana* sp. n. ♂ Wings.

♂ HOLOTYPE (Mt. Cyclops, iii. 1936) mounted as microscope preparations, ♂ paratypes cleared and preserved in glycerine. In the fusion of R_2 and R_3 in the hind wing, this species resembles the Australian species *uranka* Mosely, *australica* Ulmer and *monticola* Kimmins and also the Bornean species *montana* Kimmins. Like *uranka*, it has dorsal processes on the ninth segment but the form of the tenth segment and claspers is quite different.

Chimarra papuana sp. n.

(Text-figs. 10-11)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂.

General appearance fuscous. Venation much as in *C. schmidi* sp. n., even to the incomplete loop of 2A in the hind wing. Discoidal cell in fore wing relatively longer.

♂ GENITALIA. Eighth sternite produced in a triangular ventral process. Ninth segment with a long, straight ventral process. Tenth segment with the median lobe reduced to a membrane between the lateral lobes, apex with a V-shaped excision. Lateral lobes thin and plate-like, broad basally in side view, tapering to an elongate, slender apex. Cercus small and rounded. Aedeagus with an invaginated, membranous tube, which is densely covered with setae and spinules. Clasper from the side quadrangular, attached by one corner and with the upper apical angle produced in a long, slender, curved finger. From beneath, it is moderately broad at its base, tapering to a pointed apex and with a hooked process about half-way along the inner margin.

Length of fore wing, ♂, 4.1 mm.

♂ HOLOTYPE mounted as microscope preparations. This species differs from *cyclopica* in the presence of cell R_2 and the incomplete loop of 2A in the hind wing, the

prominent ventral process of the ninth segment and the absence of dorsal processes to this segment.

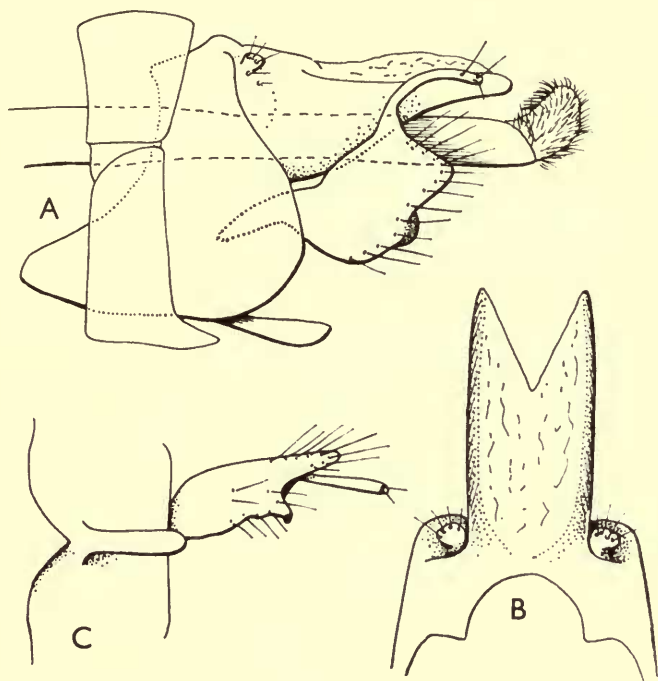


FIG. 11. *Chimarra papuana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, ventral processes of eighth and ninth segments and left clasper, ventral.

Chimarra schmidi sp. n.

(Text-figs. 12-13)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 1♂.

General appearance fuscous. Fore wing with cells R_2 and R_4 sessile, cell M_1 slightly shorter than its footstalk, Cu_{1a} with a very short footstalk. R_s sinuous, with a thickening before the discoidal cell, whose veins at the base are also thickened. Median and thyridial cells short, the latter not reaching basad to the origin of R_s . In the hind wing, cells R_2 and R_4 sessile, the former rather narrow, cell M_1 with a long footstalk, Cu_{1a} with a short footstalk, loop of $2A$ incomplete.

♂ GENITALIA. Eighth tergite and sternite distinct, the latter with a strong ventral process. Ninth segment with an outstanding ventral process, with a slightly dilated apex in side view. Tenth segment three-lobed, median lobe membranous, tapering to an acute apex dorsally and covered with microscopic setae. Lateral lobes forming a pair of thin plates, one on each side of aedeagus. Each lobe is deep at its base, with a small, rounded cercus at its upper basal angle, and tapers to a blunt apex with a small, blackened tooth at the lower angle. Two setiferous sensillae on the upper margin about midway. Aedeagus slender, cylindrical, enclosing two black spines. Clasper arising near the ventral margin, narrowed at its base in side view, parallel-sided for

most of its length, then suddenly narrowing to a short, digitate apex armed with three or four bristles. In ventral view it is falcate, base broad, inner margin bluntly serrate in basal half.

Length of fore wing, ♂, 4.5 mm.

♂ HOLOTYPE mounted as microscope preparation. Closely related to *papwana* sp. n. in venation and general pattern of genitalia, this species differs in the more

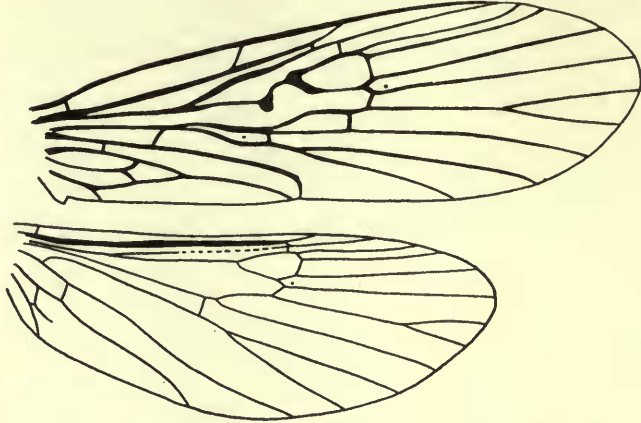


FIG. 12. *Chimarra schmidi* sp. n. ♂ Wings.

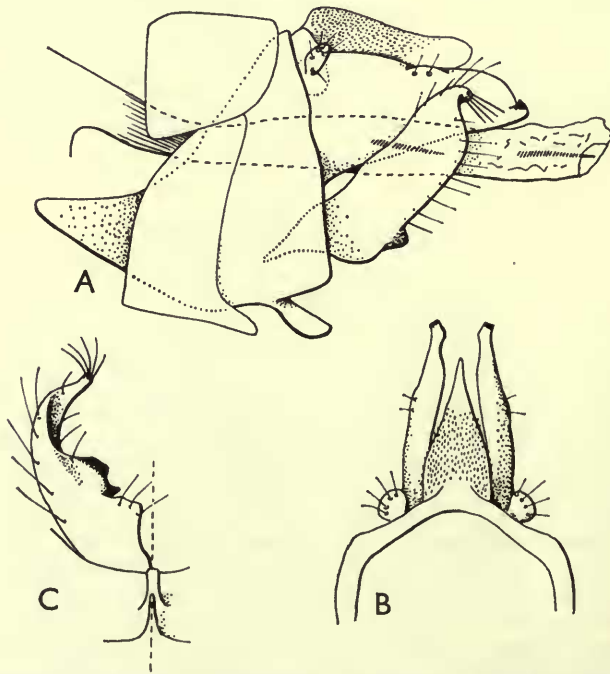


FIG. 13. *Chimarra schmidi* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, ventral processes of eighth and ninth segments and left clasper, ventral.

slender, quadrate clasper, with a shorter apical finger, the clasper in ventral view more strongly incurved. The tenth segment in side view is broader. I have much pleasure in naming this species after Dr. Fernand Schmid, the eminent Trichopterist of the Musée Zoologique, Lausanne.

Chimarra sabrona sp. n.

(Text-fig. 14)

DUTCH NEW GUINEA: Cyclops Mts., Sabron, Camp 2, 2,000 ft., vi. 1936, 2 ♂.

General appearance fuscous. Venation much as in *C. schmidi*, cell M_1 in the fore wing with a slightly shorter footstalk.

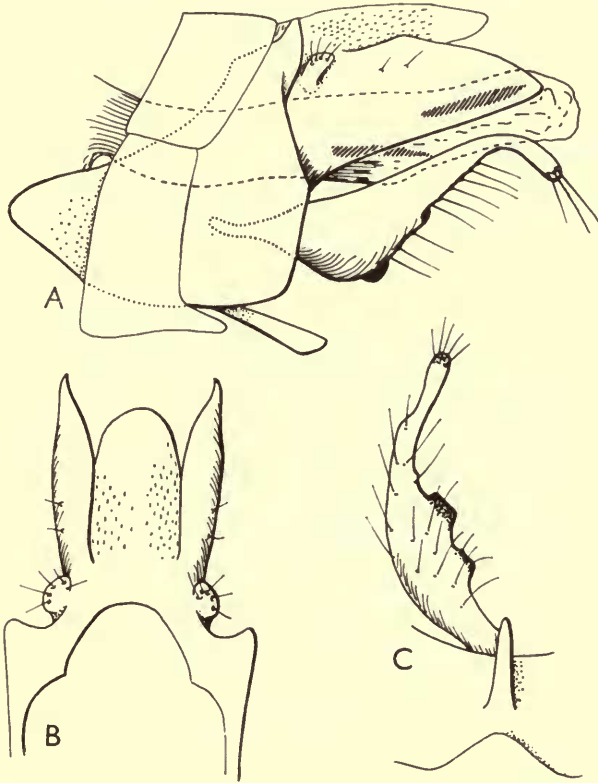


FIG. 14. *Chimarra sabrona* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, ventral processes of eighth and ninth segments and left clasper, ventral.

♂ GENITALIA: Allied to *C. schmidi* but differing in detail. Eighth sternite with a broad, rounded ventral process. Ventral process of ninth segment long, straight, slightly dilated and obliquely truncate. Tenth segment three-lobed, median lobe membranous, a little shorter than lateral lobes, apex rounded. Lateral lobes thin, plate-like, from the side broad at the base, lower margin straight, upper curving down to a rounded apex. No teeth at apex, two setiferous

sensillae towards upper margin. Cercus short, situated at upper basal angle of lateral lobe. Aedeagus cylindrical, containing two straight, black spines and an invaginated tube covered with microscopic setae. Clasper from the side broad near the base, tapering gradually to a down-curved, slender finger, tipped with a few bristles. From beneath, it is gently incurved, narrow at its base, gradually dilating to about midway, then constricting to a narrow finger. Inner margin with two blunt, blackish projections.

Length of fore wing, ♂, 3.2 mm.

♂ HOLOTYPE mounted as microscope preparation, ♂ paratype pinned. This species differs from *schmidi* in the shape of the claspers, which are gradually tapered instead of parallel-sided, and are less strongly curved in ventral view.

Chimarra ulmeri sp. n.

(Text-figs. 15-16)

PAPUA: Kokoda, 1,200 ft., vi-vii. 1933, 1 ♂, 3 ♀.

Head fuscous, darker between the ocelli, with sparse golden hairs. Antennae and palpi incomplete. Thorax fuscous, with golden hairs. Wings (rather denuded) pale fulvous, with traces of fuscous pubescence.

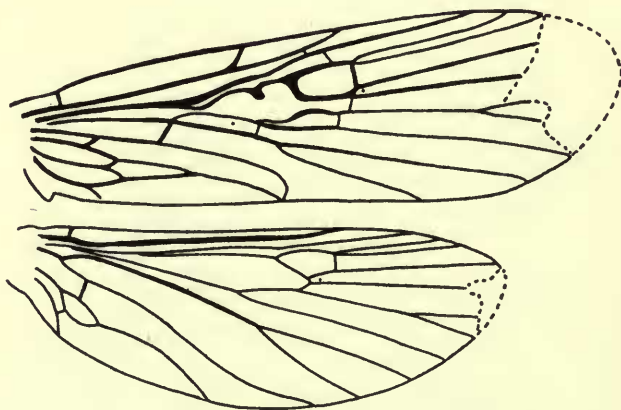


FIG. 15. *Chimarra ulmeri* sp. n. ♂ Wings.

♂ GENITALIA. Ninth segment reduced to a narrow band dorsally, ventrally long and with a median, keel-like process. Tenth segment with median lobe membranous, lateral lobes strongly sclerotized. Each lateral lobe is divided into two branches, the upper the shorter, angled upwards and with an acute apex. The lower branch is directed tailward, its lower margin straight, the upper with a rounded excision before the truncate apex, which carries two sensillae. Cercus laterally compressed, rounded in side view, short. Aedeagus cylindrical, the lower apical margin produced in a long, slender lobe. Two long spines and a pair of spines can be seen within the membrane. Clasper small, about as long as tenth segment, from the side gradually tapering

to an acute apex. From beneath, it is abruptly angled inwards at about midway, and with a serrate projection of the inner margin at the base.

Length of fore wing, ♂, 4.7 mm.

♂ HOLOTYPE pinned, one pair of wings mounted dry, abdomen in glycerine. This species resembles in male genitalia *C. thienemanni* Ulmer from Java. It differs in the shorter, more abruptly angled claspers and in the form of the tenth segment. The

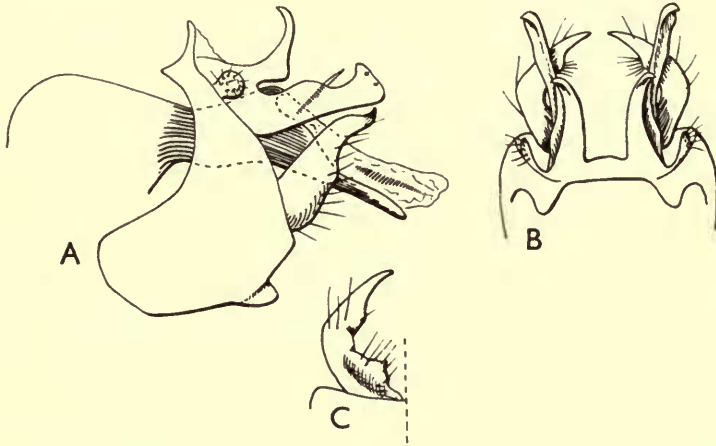


FIG. 16. *Chimarra ulmeri* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segment, dorsal; C, left clasper, ventral.

three females are referred here with some doubt, chiefly on the evidence of the rather narrow cell R_2 in the hind wing. This species is named after Dr. Georg Ulmer, who has done so much to further our knowledge of the Trichoptera and who is always willing to assist other workers from his store of knowledge.

Chimarra cheesmanae sp. n.

(Text-figs. 17-18)

DUTCH NEW GUINEA: Cyclops Mts., Mt. Lina, 3,500-4,000 ft., iii. 1936, 1 ♂.

Specimen brownish, in poor condition. Wings with fuscous pubescence. Fore wing with R_s only slightly curved, base of discoidal cell not much thickened. Median cell moderately long. Cell Cu_{1a} short, about as long as its footstalk.

♂ GENITALIA. Eighth sternite produced at the centre of its apical margin in a thin, triangular plate. Ninth segment with a short ventral keel. Tenth segment about as long as ninth, fused to it, and about half as deep. Median lobe membranous. Lateral lobes bifid, upper branches membranous, lower branches forming deep convex plates, more or less encircling the aedeagus, rounded apically and with sinuous ventral margins in side view. Lateral margins each with a small tooth or sensilla. Cercus small. Aedeagus with two stout, straight, internal spines. Clasper

moderately long, upcurved and tapering in side view ; from beneath, stout basally, tapering to about midway, apex incurved and acute. There is a stout tooth about half-way along the inner margin.

Length of fore wing, ♂, 4 mm.

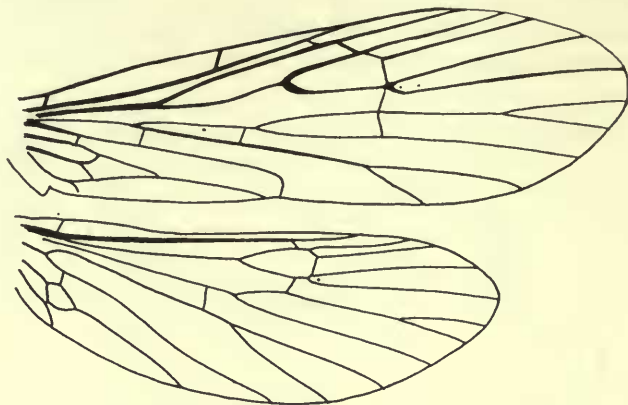


FIG. 17. *Chimarra cheesmanae* sp. n. ♂ Wings.

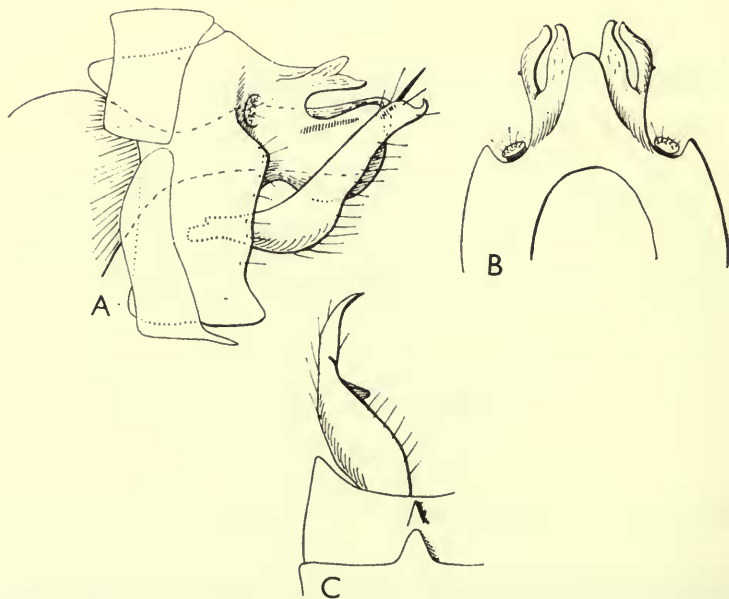


FIG. 18. *Chimarra cheesmanae* sp. n. ♂ Genitalia. A, lateral ; B, ninth and tenth segments, dorsal ; C, ventral processes of eighth and ninth segments and claspers, ventral.

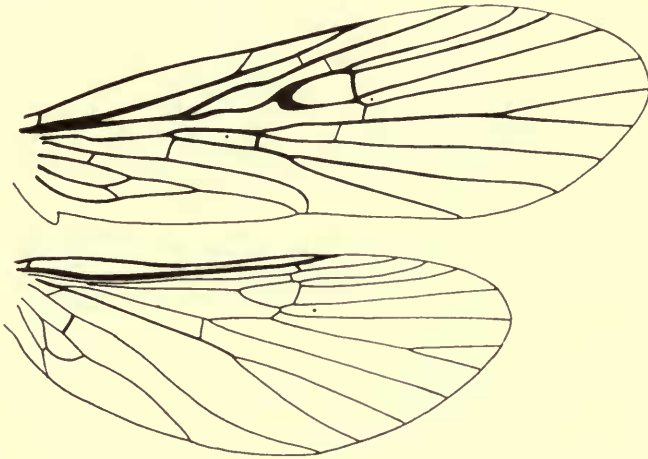
♂ HOLOTYPE mounted as microscope preparations. This species may be distinguished from *ulmeri* by the deeper, more convex lower branches of the tenth segment, the more elongate clasper and the presence of a ventral process to the eighth sternite.

Chimarra falcata sp. n.

(Text-figs. 19-20)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 2 ♂.

Head ochraceous, fuscous between the ocelli and at the sides of the occiput, pubescence golden. Antennae and palpi fuscous. Thorax reddish fuscous, legs brownish with darker spurs, hind tibia fuscous. Wings fuscous, with reddish fuscous pubescence. Fore wing with R_s sinuous, base of discoidal cell with veins much thickened; cells R_2 and R_4 sessile, cell M_1 about as long as its footstalk, cell Cu_{1a} with short footstalk. In hind wing, cells R_2 and R_4 sessile, cell M_1 shorter than its footstalk, cell Cu_{1a} with a short footstalk.

FIG. 19. *Chimarra falcata* sp. n. ♂ Wings.

♂ GENITALIA. Eighth segment short, with tergite and sternite more or less fused into a complete ring. Ninth segment short above, with a small, keel-like ventral process in centre of sternite. Tenth segment more or less fused to ninth, median lobe reduced to membrane, lateral lobes long and narrow, each with a single sensilla on upper surface towards apex. The upper surface has an incurving ridge about midway. Cercus short, laterally compressed. Aedeagus cylindrical, with a bulbous base and an obliquely truncate apex. Within the enclosed membrane can be seen a pair of straight, black spines, a single, pale, curved spine and a patch of spinules. Clasper directed upward, apex curving inward above the tenth segment. Seen from beneath and behind, it is acutely falcate, arising from a short, broad base.

Length of fore wing, ♂, 5.4 mm.

♂ HOLOTYPE mounted as microscope preparations, ♂ paratype pinned, with abdomen in glycerine. *C. falcata* differs from the two preceding species in having the lateral lobe of the tenth segment entire.

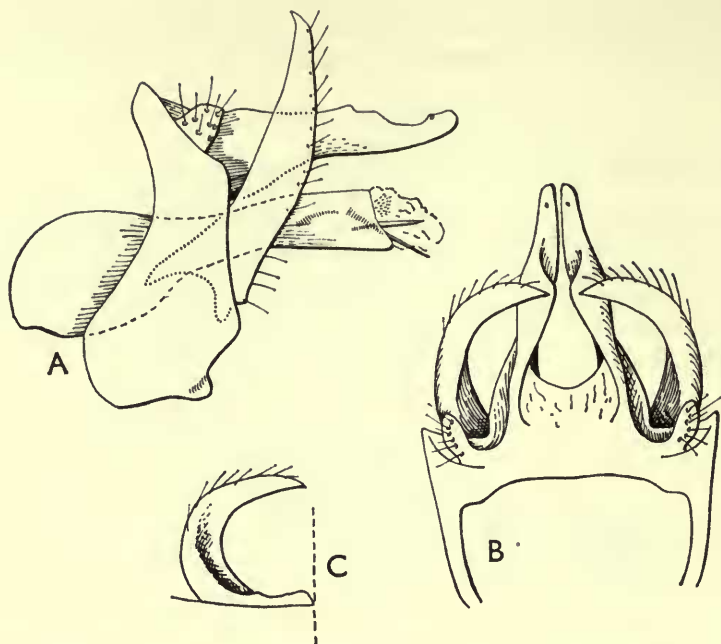


FIG. 20. *Chimarra falcata* sp. n. ♂ Genitalia. A, lateral; B, dorsal (aedeagus omitted); C, left clasper, ventral.

***Chimarra sinuosa* sp. n.**

(Text-figs. 21-22)

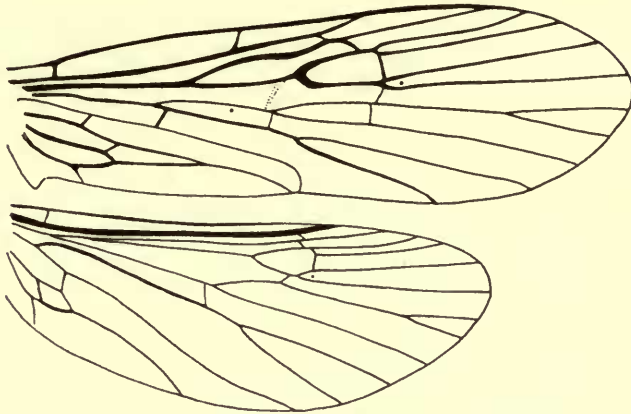
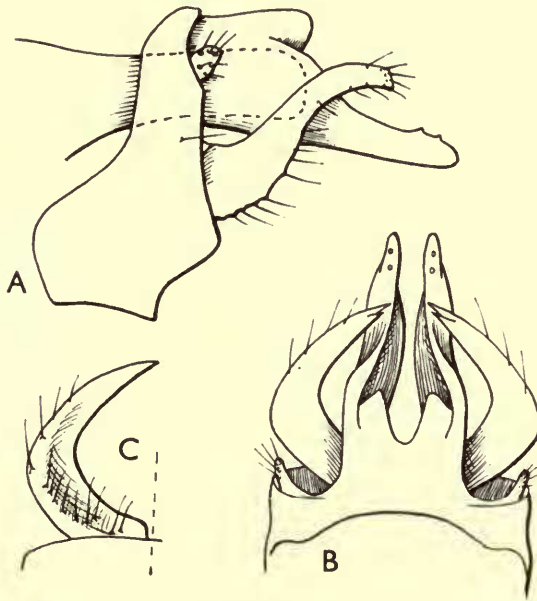
DUTCH NEW GUINEA: Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, 1 ♂.

Type in poor condition, somewhat moulded. General colour brownish. Venation much as in *C. falcata*, but *Rs* in fore wing only slightly curved.

♂ GENITALIA. Eighth segment more or less divided into tergite and sternite. Ninth segment narrowed above, in side view with upper margin slightly produced; ventrally with a small, keel-like process. Tenth segment partially fused to ninth, median lobe short, excised at its centre, lateral margins sclerotized, projecting above the base of the lateral lobe. The latter is elongate, tapering apically, with two sensillae on upper surface at apex. From above, the upper margin is sinuous, lower margin incurved. Cercus short, laterally compressed. Clasper falcate, from above acute apically, with a short, acute tooth just above the apical one. From the side, the clasper is sinuous, curving upward and then tailward and inward over the tenth segment.

Length of fore wing, ♂, 4.7 mm.

♂ HOLOTYPE in glycerine, one pair of wings mounted dry. This species is closely related to *falcata*, from which it differs in the straighter *Rs* in the fore wing, the more sclerotized median lobe of the tenth segment, the produced apical margin of the ninth segment and the sinuously curved, bidentate claspers.

FIG. 21. *Chimarra sinuosa* sp. n. ♂ Wings.FIG. 22. *Chimarra sinuosa* sp. n. ♂ Genitalia. A, lateral; B, dorsal (aedeagus omitted); C, left clasper, ventral.***Chimarra kokodana* sp. n.**

(Text-figs. 23-24)

PAPUA: Kokoda, 1,200 ft., viii. 1933, 1 ♂, 1 ♀.

Head and thorax ochraceous, with golden hairs, antennae fulvous. Palpi (incomplete) fulvous, becoming darker towards apices. Legs ochraceous, spurs pale fuscous. Wings hyaline, with pale golden or ochraceous pubescence, slightly darker over the anastomosis. In fore wing, R_1 and R_s both strongly sinuous, thyridial cell long and narrow.

♂ GENITALIA. Ninth segment rather short, with a short ventral protuberance at its base. Tenth segment with median lobe membranous, lateral lobes elongate, plate-like, from the side tapering from midway to a rounded apex, carrying a group of four or five sensillae on its upper margin. From beneath, the lateral lobes are parallel-sided, apices slightly dilated and out-turned.

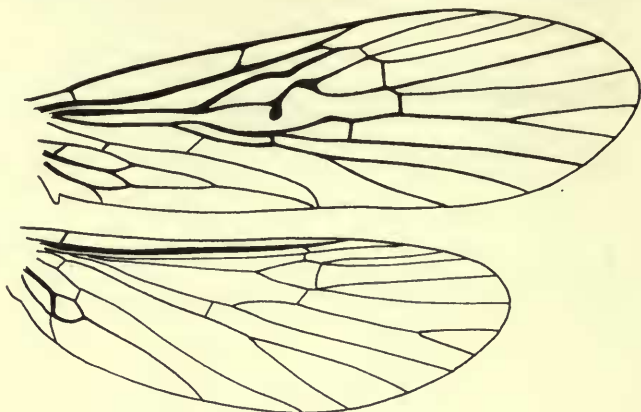


FIG. 23. *Chimarra kokodana* sp. n. ♂ Wings.

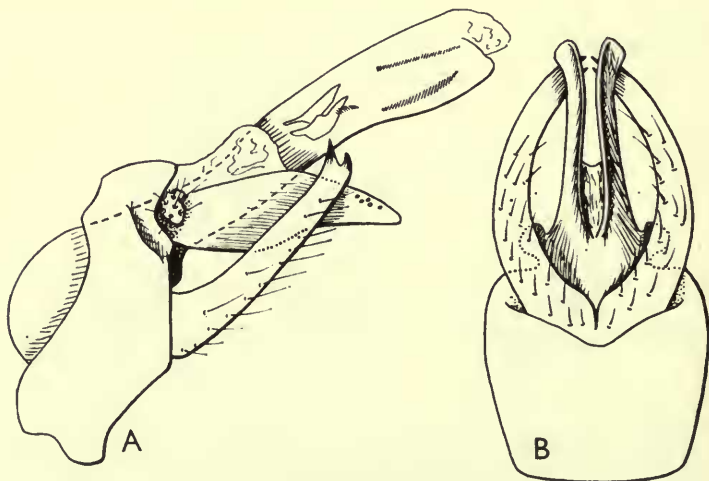


FIG. 24. *Chimarra kokodana* sp. n. ♂ Genitalia. A, lateral; B, from behind and below.

Cercus short, rounded, projecting laterally, at base of tenth segment. Aedeagus long, cylindrical, enclosing three pairs of spines. Clasper falcate from behind, slender, curving upward over the tenth segment. Its apex terminates in two acute teeth.

Length of fore wing, ♂, 3.8 mm.

♂ HOLOTYPE pinned, with one pair of wings mounted dry, abdomen in glycerine. This species is related to *falcata* and *sinuosa*, but differs in the more sinuate R_1 and

*R*s in the fore wing, the less strongly falcate claspers, which are not sinuate, and the less developed ventral process. The female is referred here with some doubt.

Chimarra spp.

PAPUA : Kokoda, 9,200 ft., vi-ix. 1933, 5 ♀.

PAPUA : Mt. Tafa, 8,500 ft., iii. 1934, 1 ♀.

PAPUA : Mondo, 5,000 ft., i-ii. 1934, 1 ♀.

DUTCH NEW GUINEA : Mt. Cyclops, 3,500 ft., iii. 1936, 10 ♀ ; Sabron, Camp 2, 2,000 ft., vii. 1936, 1 ♀.

I have been unable to associate these specimens with any of the species described in the present paper.

Family POLYCENTROPODIDAE

KEY TO PAPUAN SPECIES OF *Polycentropus* (MALES)

- 1 Fore wing with numerous spots of golden pubescence on a brown ground *grandis* sp. n.
- Fore wing without spots of golden pubescence 2
- 2 Membrane of fore wing with hyaline spots or areas (in addition to those bordering the *R*₁-*R*s and *r-m* cross-veins, the cross-vein closing the median cell, and at the base of this cell) 3
- Membrane of fore wing without hyaline areas or spots other than those listed above 4
- 3 Fore wing with three large hyaline areas, apical margin of wing distinctly sinuate *sinuosus* sp. n.
- Fore wing with numerous hyaline spots, apical margin of wing less sinuate *moselyi* sp. n.
- 4 Prothorax yellow, with golden hairs *auricollis* sp. n.
- Prothorax fuscous, with dark hairs 5
- 5 Male cerci simple, without inner branches, paraproctal hooks scarcely divergent *piceus* sp. n.
- Male cerci with inner branches, paraproctal hooks strongly divergent at apices 6
- 6 Cerci in lateral view a little more than twice as long as broad, paraproctal hooks simple at apices ; claspers in ventral view one and a half times as long as broad *rosselinus* Navás
- Cerci three times as long as broad, paraproctal hooks bifid at apices ; claspers in ventral view two and a half times as long as broad *similis* sp. n.

Polycentropus australis Ulmer is not included in the key but is possibly closely related to either *P. rosselinus* or *P. similis*.

Polycentropus grandis sp. n.

(Text-figs. 25-27)

PAPUA : Mt. Tafa, 8,500 ft., iii. 1934, 10 ♂, 4 ♀ ; Mondo, 5,000 ft., i-ii. 1934, 1 ♂, 1 ♀.

Head yellowish brown, densely clothed above with golden hairs, shading to dark brown laterally. Antennae fuscous, faintly annulated with yellowish brown. Palpi yellowish brown. Thorax brownish, with median tufts of golden hairs and fuscous tufts at the tegulae. Legs golden brown. Abdomen brownish. Fore wing densely clothed with brownish pubescence, upon

which are scattered circular spots of golden pubescence, not very numerous, with four or five larger patches along the posterior margin. Membrane brownish, with similar pale yellowish spots. Hind wing with smoky brown membrane, sparsely clothed with yellowish pubescence.

♂ GENITALIA. Ninth segment membranous above and merged with the tenth, which projects as a short tube or hood, to whose lower lateral margins are fused the more sclerotized paraprocts,

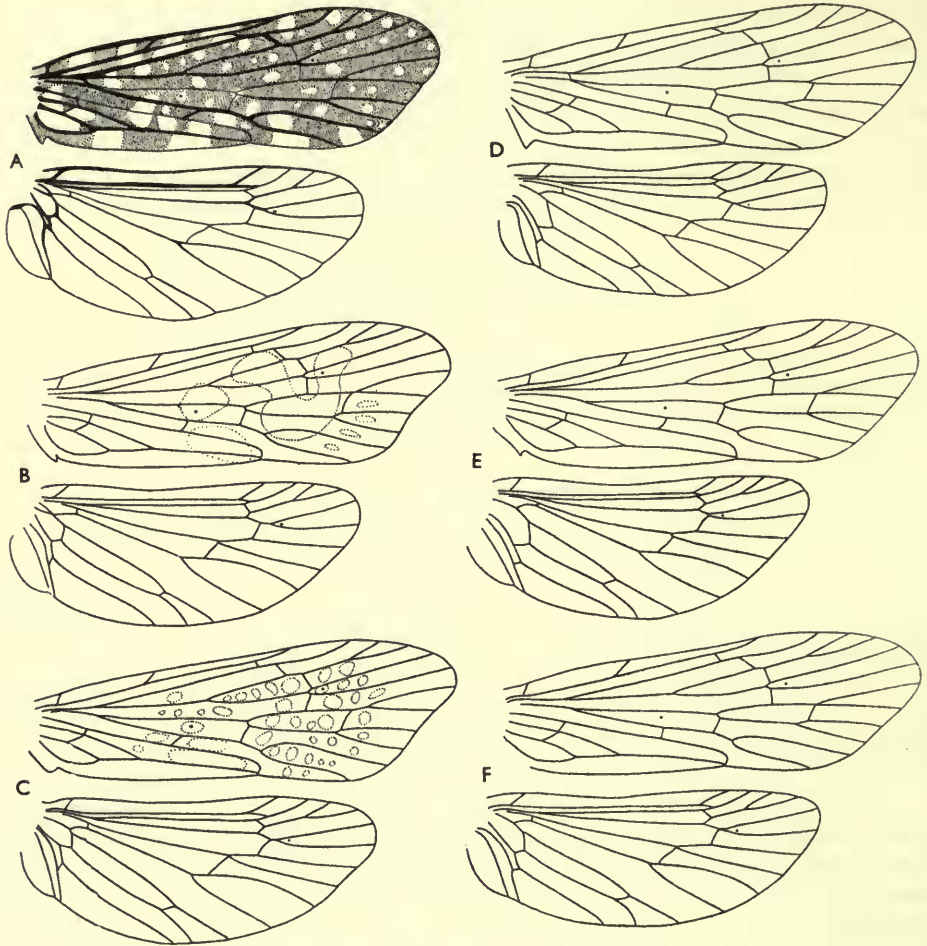


FIG. 25. Wings of *Polycentropus* spp. n. A, *grandis*; B, *sinuosus*; C, *moselyi*; D, *auricollis*; E, *piceus*; F, *similis*.

which project as small, setose lobes apically. Cerci forming tapering lobes, directed upwards and mesally over the tenth segment, each with a long, straight spine hinged to its apex. A slender, finger-like process arises from the inner surface of the cercus about midway. Aedeagus cylindrical, arising from a bulbous base. Claspers spatulate, divergent, in ventral view rather broader at their bases, apices rounded. In side view, each clasper carries a flattened, blackish basal branch on its upper surface, about two-thirds as long as main branch, its apex somewhat clavate in ventral view. Upper surface of main branch with a median, blackish ridge.

♂ GENITALIA. Ninth segment membranous above, lightly sclerotized and largely withdrawn within the eighth tergite. Lateral gonapophyses bluntly foliate, about as long as eighth tergite. Subgenital plate of eighth segment forming a tapering scoop, situated between the lateral gonapophyses.

Length of fore wing, ♂, 10-11 mm., ♀, 13-14 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype with abdomen cleared and preserved in glycerine, and paratypes pinned. The large size and boldly

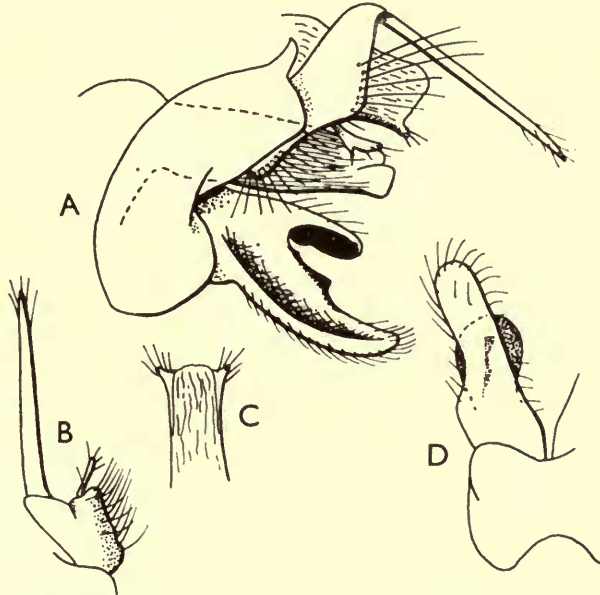


FIG. 26. *Polycentropus grandis* sp. n. ♂ Genitalia. A, lateral; B, left cercus, dorsal; C, tenth segment and paraprocts, dorsal; D, clasper and ninth segment, ventral.

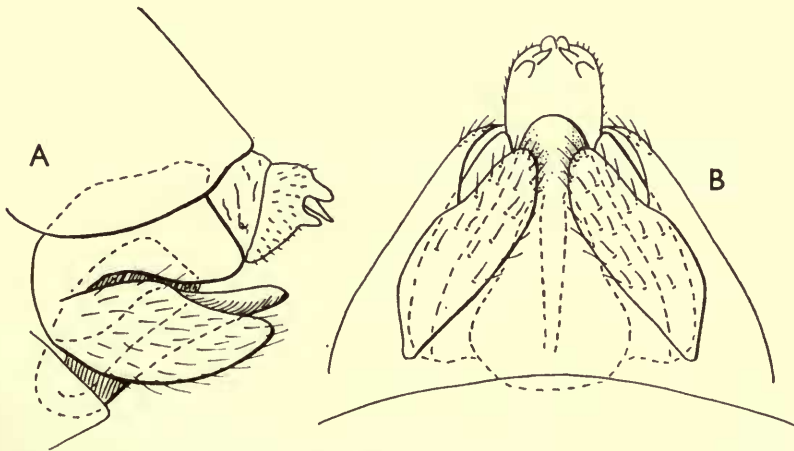


FIG. 27. *Polycentropus grandis* sp. n. ♀ Genitalia. A, lateral; B, ventral.

spotted wings will distinguish this species from any of the Papuan *Polycentropus* spp. described so far. In structure of the male genitalia, it is related to the *P. maculatus* group of species from North America. It also shows some resemblance to *Polyplectropus grandis* Banks, both in wing pattern and in male genitalia, but Dr. W. L. Brown, of the Museum of Comparative Zoology, Cambridge, Mass., confirms that there is no cubito-anal cross-vein nor fork R_2 in the hind wing of *grandis* Banks, which therefore cannot be a *Polycentropus*.

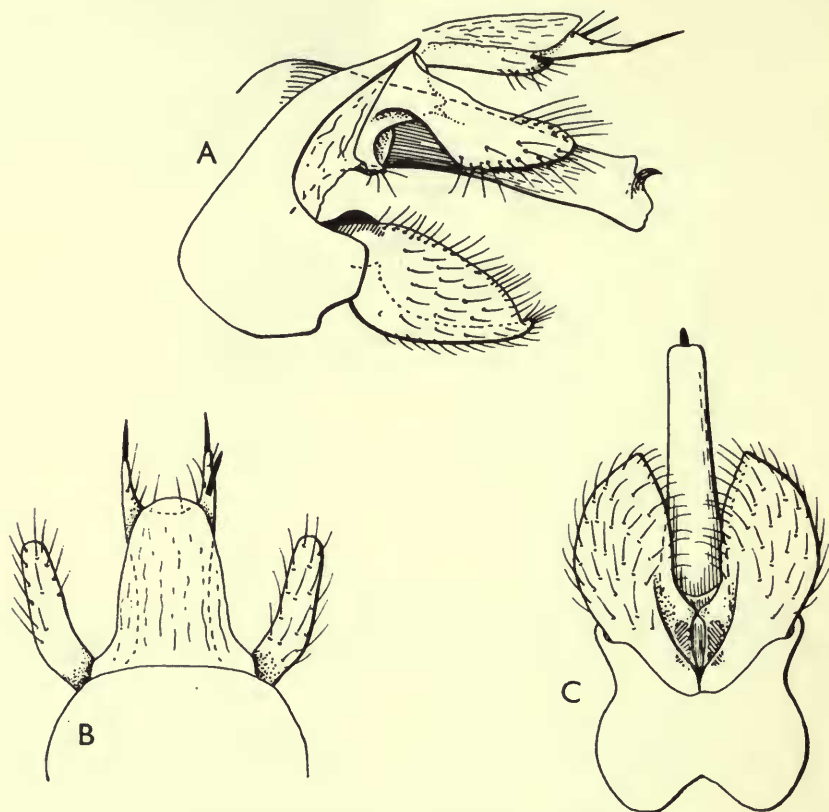


FIG. 28. *Polycentropus sinuosus* sp. n. ♂ Genitalia. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral.

***Polycentropus sinuosus* sp. n.**

(Text-figs. 25, 28)

PAPUA: Kokoda, 1,200 ft., vi. 1933, 2 ♂; Matsika, 3,000 ft., xii. 1933, 1 ♂.

Head fuscous, with dark reddish brown hairs. Antenna stout, fuscous, with paler annulations. Palpi fulvous. Thorax and abdomen fuscous, the former with dark reddish brown hairs. Fore wing densely clothed with golden brown pubescence; membrane pale brownish, with an irregular pale marking in the centre of the wing, somewhat resembling a question mark, and a few smaller

spots. Hind wing sparsely pubescent, membrane hyaline. Apical margin of fore wing with a shallow, sinuous excision.

♂ GENITALIA. Tenth segment fused with ninth, membranous in its upper part. To its lower surface are fused the more sclerotized paraprocts, which terminate in short fingers, carrying one or two stout, black spines and with a number of finer setae on the ventral surface of the tenth segment, which is slightly keeled. Cercus about as long as ninth segment, narrow basally in side view, dilated on its lower surface about midway. On its inner surface are two short branches, the upper consisting of a small lobe bearing a short finger, and the lower a small, curved lobe bearing setae. Aedeagus cylindrical, straight, armed at its apex with a single, blackened claw. Clasper short and broad, forming a foliate scoop with a pointed apex, upper basal branch small and black.

Length of fore wing, ♂, 7-8 mm.

♂ HOLOTYPE mounted as microscope preparations (Kokoda, vi. 1933), ♂ paratypes pinned. In the reduced paraprocts, this species shows some resemblance to *P. grandis* sp. n., but is readily separable from that species by the unicolorous wings and by the form of the cercus, which is not produced apically in a long, straight spine.

Polycentropus moselyi sp. n.

(Text-figs. 25, 29)

PAPUA: Mondo, 5,000 ft., i-ii. 1934, 1 ♂, 1 ♀.

Head fuscous with brownish hairs. Palpi fuscous. Antennae dark fulvous, with paler annulations. Thorax fuscous, with brown hairs. Legs dark fulvous. Abdomen fuscous. Fore wing clothed with reddish brown pubescence, membrane pale brownish, with numerous pale spots. Apical margin slightly excised.

♂ GENITALIA. Somewhat similar in pattern to *P. sinuosus* sp. n. The membranous tenth segment is fused with the ninth and with the paraprocts, which project as lateral fingers beyond the tenth. Each carries a few small setae but no strong spines. The cercus is more gently clavate and rounded apically in side view, with one or two small processes on the inner surface towards the apex. At its base on the inner surface there are two processes (as in *sinuosus*) but the upper one is much longer and slender. Aedeagus rather short and stout, without apical claw. Clasper from the side longer and narrower, tapering from base to apex, inner margin raised up about midway in a strong, acute tooth. Upper basal branch arising almost at right angles, slender, clavate apically. From beneath, the clasper is also longer and narrower than in *sinuosus*, truncate apically.

♀ GENITALIA. Lateral gonapophyses long and broadly ovate. Subgenital plate from beneath broad and trilobed, apex of median lobe projecting beyond lateral gonapophyses. Between the subgenital plate and ninth segment is a large pocket on each side, lined with dense setae.

Length of fore wing, ♂, 10 mm., ♀, 11 mm.

♂ HOLOTYPE pinned, one pair of wings mounted dry between celluloid, abdomen in glycerine, ♀ allotype pinned, abdomen in glycerine. This species (the male of which was identified by Mosely as *P. australis* Ulmer) is closely related to *P. sinuosus* sp. n. and in addition to the differences in the male genitalia, may be distinguished by the spotted membrane of the fore wing. I was quite prepared to accept Mosely's determination of the pinned insect until I made a preparation of the abdomen, which revealed too many features not reconcilable with Ulmer's figure.

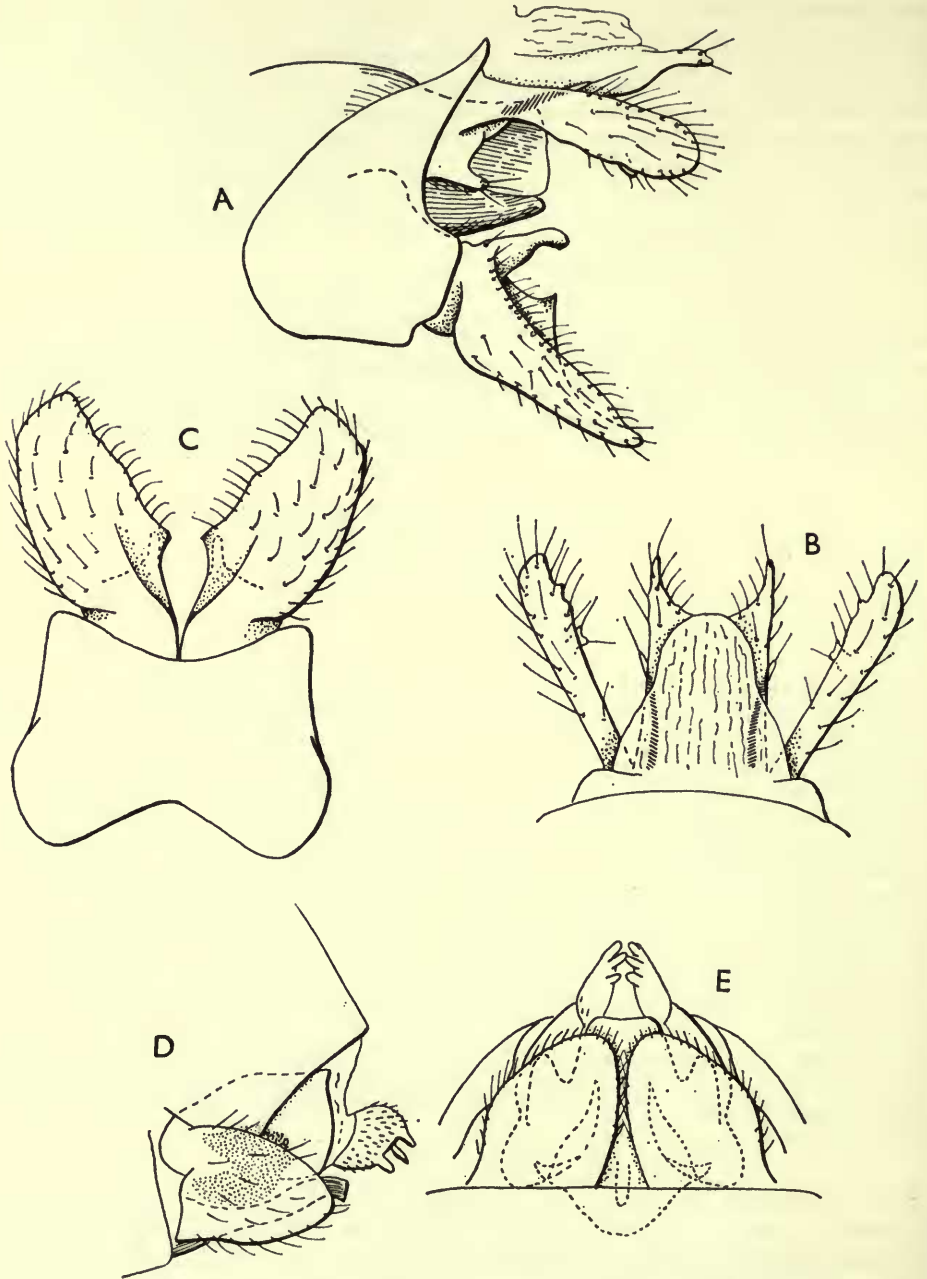


FIG. 29. *Polycentropus moselyi* sp. n. Genitalia. ♂, A-C, ♀, D-E. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers, ventral; D, lateral; E, ventral.

Polycentropus auricollis sp. n.

(Text-figs. 25, 30)

PAPUA: Kokoda, 1,200 ft., vii, ix. 1933, 4♂, 11 ♀.

General appearance dark brown as in *P. piceus* sp. n., but distinguishable from that species by the yellow prothorax, clothed with golden hairs.

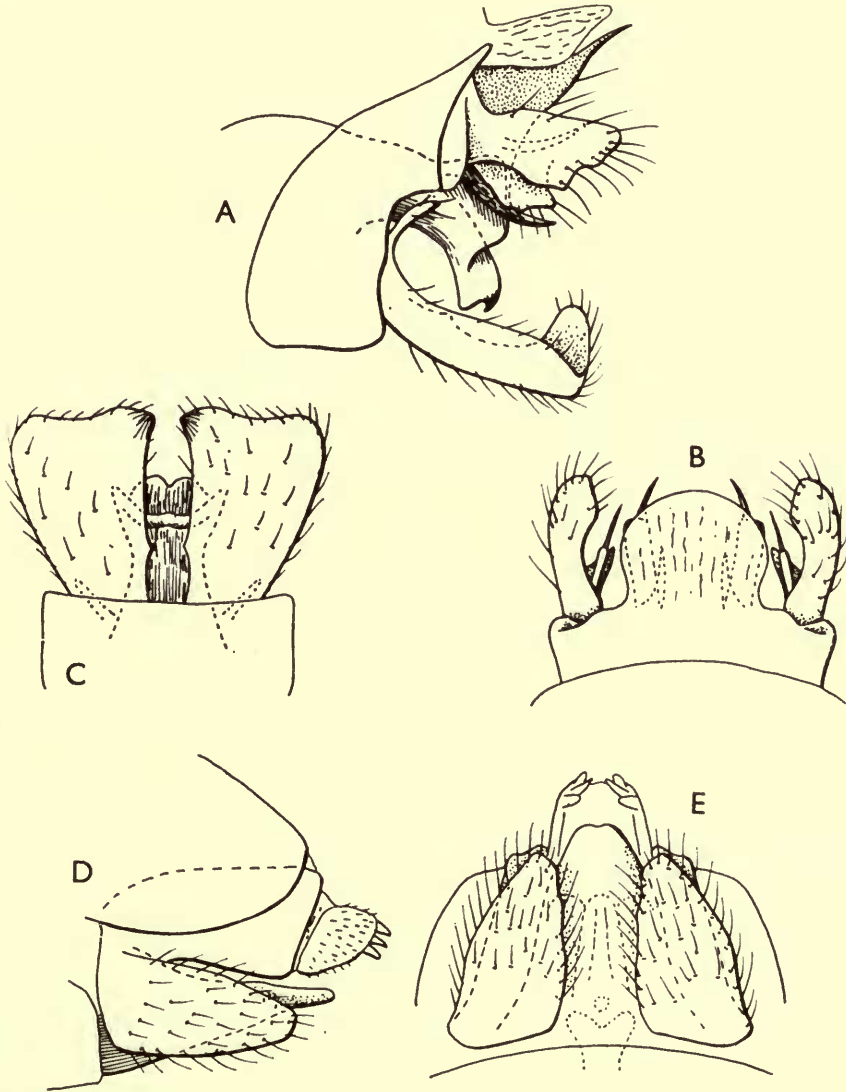


FIG. 30. *Polycentropus auricollis* sp. n. Genitalia. ♂, A-C, ♀, D-E. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral; D, lateral; E, ventral.

♂ GENITALIA. Ninth segment membranous above and merged with the tenth. The latter is lanceolate from the side and forms a rounded lobe from above, its base slightly constricted. Cercus a little longer than the tenth segment, in side view moderately broad, then constricted near base, upper margin beyond constriction straight, lower margin irregularly dilated. From above, cercus is slightly incurved and carries on its inner surface two processes, the upper slender, upcurved and digitate, terminating in a spine. The lower process forms a broad lobe, curved mesally and acute in dorsal view. Paraproctal process wide at base in side view, upper apical angle projecting in a single, slender spine, lower apical angle produced tailward in an acute claw. Aedeagus cylindrical, downcurved, with a pair of erect, quadrate lobes on its upper surface, apex of aedeagus terminating in a pair of divergent, downturned claws. Clasper long and slender in side view, inner apical angle curled upwards in a rounded lobe. From the base arises a slender, curved, digitate upper branch. In ventral view the clasper dilates from its base to a sinuously truncate apex, a small tooth on the inner margin in basal half.

♀ GENITALIA. Eighth sternite produced in a long, tapering subgenital plate with a slightly bilobed apex. Ninth segment partly enclosed within the eighth, lateral gonapophyses projecting beyond ninth segment, margins gently convex, apex narrow and truncate or bluntly rounded.

Length of fore wing, ♂, 5-6 mm., ♀, 5-7 mm.

♂ HOLOTYPE mounted as microscope preparations (vii. 1933), ♀ allotype pinned, with abdomen mounted in glycerine, paratypes pinned. Although similar in appearance to *P. piceus* sp. n. (apart from the yellow prothorax), this species differs markedly in both ♂ and ♀ genitalia. In the male, the cercus is more complex, bearing two branches or inner processes, the paraproctal process has both upper and lower branches, the aedeagus is more strongly developed and the clasper is quite different in form, the upper basal branch being represented by a slender finger. In the female, the lateral gonapophyses are narrower and truncate apically or bluntly rounded.

Polycentropus piceus sp. n.

(Text-figs. 25, 31)

PAPUA: Kokoda, 1,200 ft., x. 1933, 1 ♂, viii-ix, 1933, 1 ♀.

Head piceous, with fuscous hairs. Antennae stout, piceous, with reddish fuscous pubescence. Palpi fuscous. Thorax piceous, with fuscous hairs. Legs fuscous. Abdomen fuscous. Wings fuscous, with sparse reddish brown pubescence, immaculate apart from the whitish *r-m* cross-vein and base of median cell in fore wing and the *r-m* and *m-cu* cross-veins in hind wing.

♂ GENITALIA. Ninth segment membranous above and merged with the membranous tenth segment, which forms a paraboloid hood and bears on its ventral median line a row of stout setae. Cercus digitate from above, flattened and foliate from the side. Paraproctal hooks directed mesally and then outwards and upwards beneath the tenth segment. Aedeagus cylindrical, its apex from beneath slightly dilated. Clasper stout at base, in side view tapering gradually to a slender, incurved, hooked apex. Upper branch short, directed mesally in a blackened finger.

♀ GENITALIA. Eighth sternite forming a lightly sclerotized, spatulate subgenital plate, extending somewhat beyond the lateral gonapophyses. Ninth segment partly sunk within the eighth, lateral gonapophyses from the side with triangular apices, upper margin slightly concave.

From beneath, the apices are more rounded and between each plate and the ninth segment itself is a roughened pocket. Tenth segment small, with the usual three pairs of processes.

Length of fore wing, ♂, 6 mm., ♀, 6.5 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine. This species differs from *P. rosselinus* Navás in the more triangular clasper in side view, the smaller upper basal branch, the smaller paraproctal hooks and narrower cerci, without a slender inner branch.

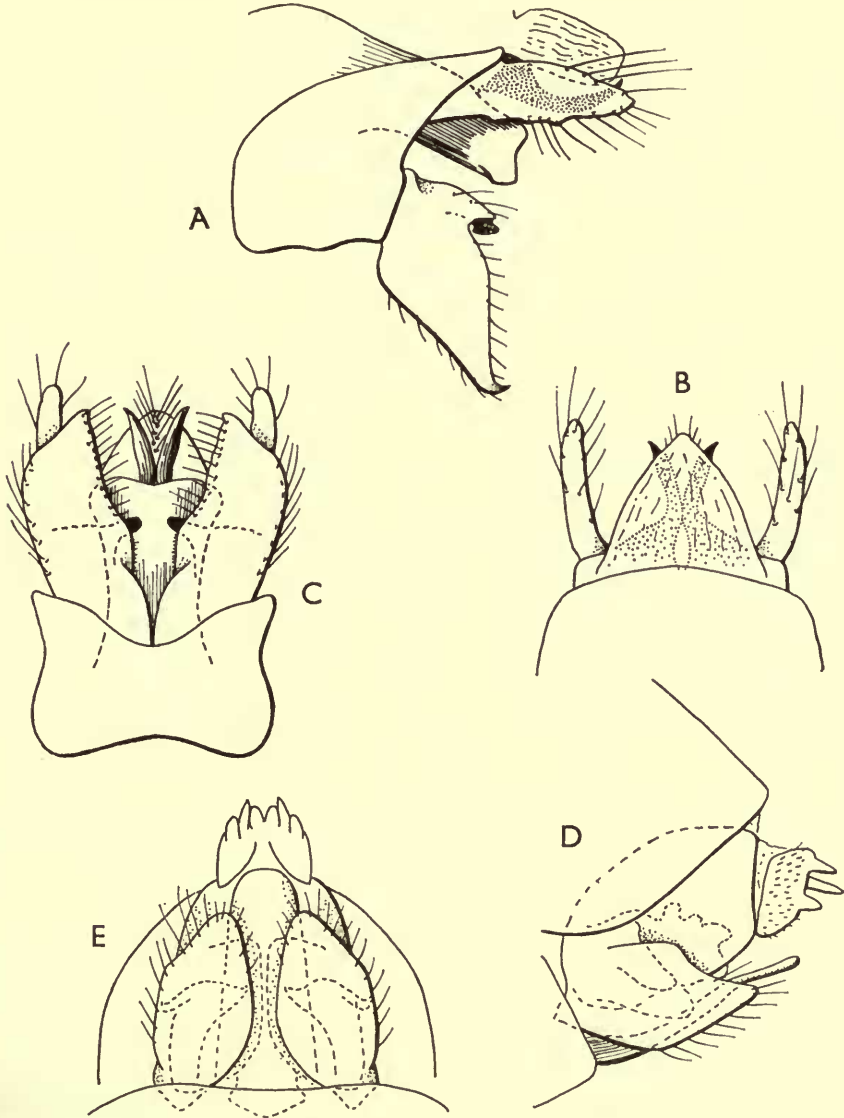


FIG. 31. *Polycentropus piceus* sp. n. Genitalia. ♂, A-C; ♀, D-E. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, ventral; D, lateral; E, ventral.

Polycentropus rosselinus Navás

(Text-fig. 32)

I take the opportunity of figuring the male genitalia of a paratype of this species, from Rossel Isl., Mt. Rossel, 9,100 ft., xi-xii.1915, W. F. Eichhorn.

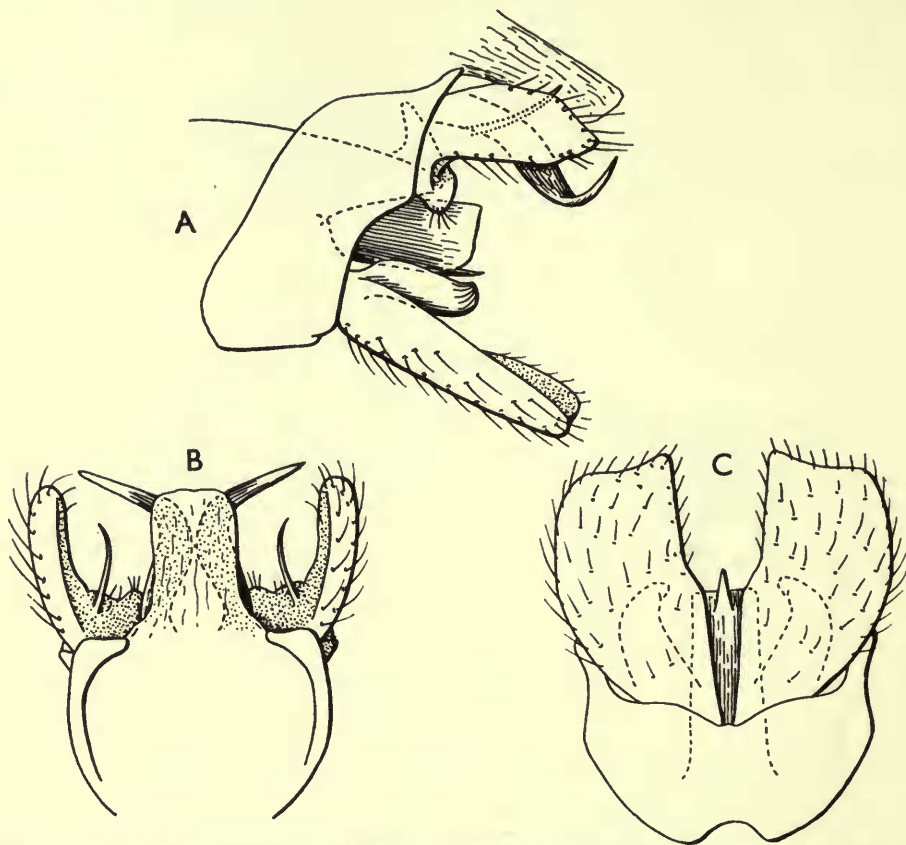


FIG. 32. *Polycentropus rosselinus* Navás, ♂ Paratype, genitalia. A, lateral; B, cerci, tenth segment and paraprocts, dorsal; C, claspers and aedeagus, ventral.

Polycentropus similis sp. n.

(Text-figs. 25, 33)

PAPUA: Kokoda, 1,200 ft., vi.1933, 2 ♂.

Head dark fuscous, with dark brown hairs. Antennae fuscous, with fulvous annulations, more noticeable on the ventral side. Palpi fuscous. Thorax fuscous above, with brown hairs, paler on sides and beneath. Legs fulvous. Abdomen fuscous, terminalia fulvous. Fore wing densely clothed with dark reddish brown pubescence, membrane pale fuscous, with whitish areas around

the *r-m* cross-vein, the cross-vein closing the median cell, the base of the median cell and the *m-cu* cross-vein. Hind wing smoky hyaline, sparsely pubescent.

♂ GENITALIA. Tenth segment membranous, fused with the ninth and forming a short rounded hood. Paraproctal process stout, somewhat swollen shortly before apex, which is divided into two acute spines, one above the other and directed outwards. Cercus rather slender, digitate,

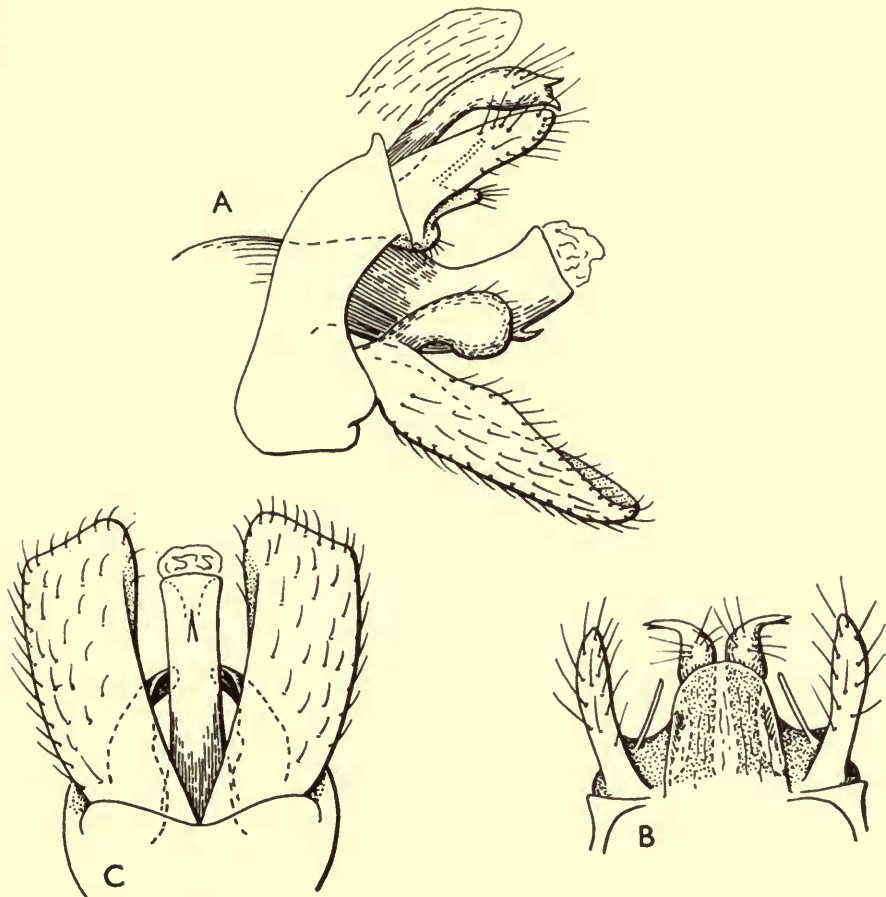


FIG. 33. *Polycentropus similis* sp. n. ♂ Genitalia. A, lateral; B, cerci, tenth segment and paraproct, dorsal; C, claspers and aedeagus, ventral.

arising from a broader base and bearing on its inner surface two processes, one very slender, the other stouter and terminating in a tuft of bristles. Aedeagus cylindrical, with a short, acute tooth on ventral surface before apex, which bears some evertible membrane. Clasper elongate, rather narrower from the side than from beneath, in which aspect it is slightly incurved, parallel-sided, with an obliquely truncate apex. Upper basal branch stout, arched and clavate from the side, tapering and incurved from beneath, blackish.

Length of fore wing, ♂, 7-7.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. This species is obviously closely related to *P. rosselinus* Navás and I at first considered it as a

variety of that species. Comparison with a paratype of that species has shown a number of differences in the male genitalia: the more dilated and bifid paraprocts, narrower cerci and narrower claspers with more strongly developed basal branches. In the aedeagus, the ventral tooth is situated pre-apically but this may be due to varying degrees of eversion of the membrane. The possibility cannot be ruled out that *rosselinus* or *similis* may prove to be synonymous with *P. australis* Ulmer. Figures of cleared examples do not agree with Ulmer's figures, but in pinned specimens the upper basal branch of the clasper may be obscured and the apex of the aedeagus appears as an open tube. Judging from the shape of the cercus, *rosselinus* is most like *australis*, but has not the two-spined paraprocts of *australis* and *similis*.

Family PSYCHOMYIIDAE

Tinodes aberrans sp. n.

(Text-fig. 34)

PAPUA: Kokoda, 1,200 ft., vi-ix. 1933, 2 ♂, 12 ♀.

General coloration blackish brown. A tuft of pale hairs between the bases of the antennae, the latter having pale annulations. The fore wing differs from the typical *Tinodes* venation in the absence of the cross-vein closing the median cell.

♂ GENITALIA. Ninth and tenth segments produced in a narrow hood with a membranous apex. Beneath it are a pair of slender paraprocts, fused at their bases. Aedeagus long and slender, with three spines or parameres; the most basal is on the ventral surface, the next (and longest) is lateral and the shortest is set on the dorsal surface. Apex of aedeagus curled downwards. Cerci very long and slender. Claspers fused basally, with a V-shaped excision between them, globose from the side and terminating in a short spine and two branches. One branch is digitate, hairy at its apex and the other is spiniform, bent inwards and then tailwards. Basal plate triangular, with a long, slender apodeme. Apically it projects in a long, tapering spine, its lower surface expanded downwards in a rounded keel. At the base of the plate, on its ventral side, is a pair of short, divergent fingers.

♀ GENITALIA. Eighth sternite emarginate at its centre. Ninth and tenth segments forming a long ovipositor.

Length of fore wing, ♂, 3.5 mm., ♀, 3-4 mm.

♂ HOLOTYPE (ix. 1933) mounted as microscope preparations, ♀ allotype pinned, with abdomen in glycerine, paratypes pinned. In structure of claspers this species shows some resemblance to *Tinodes igok* Kimmins (Sarawak), but the basal plate is more developed and the aedeagus and tenth segment differ considerably. It also agrees with *T. igok* and *T. silvicola* Kimmins (Sarawak) in the absence of the cross-vein closing the median cell in the fore wing. In the case of the two species from Sarawak, each was represented by a single example, but in the present species the cross-vein appears to be absent from all examples. Nevertheless, I do not think the erection of a new genus for these species to be justified, in view of the similarity of the male genitalia to those of other species of *Tinodes*.

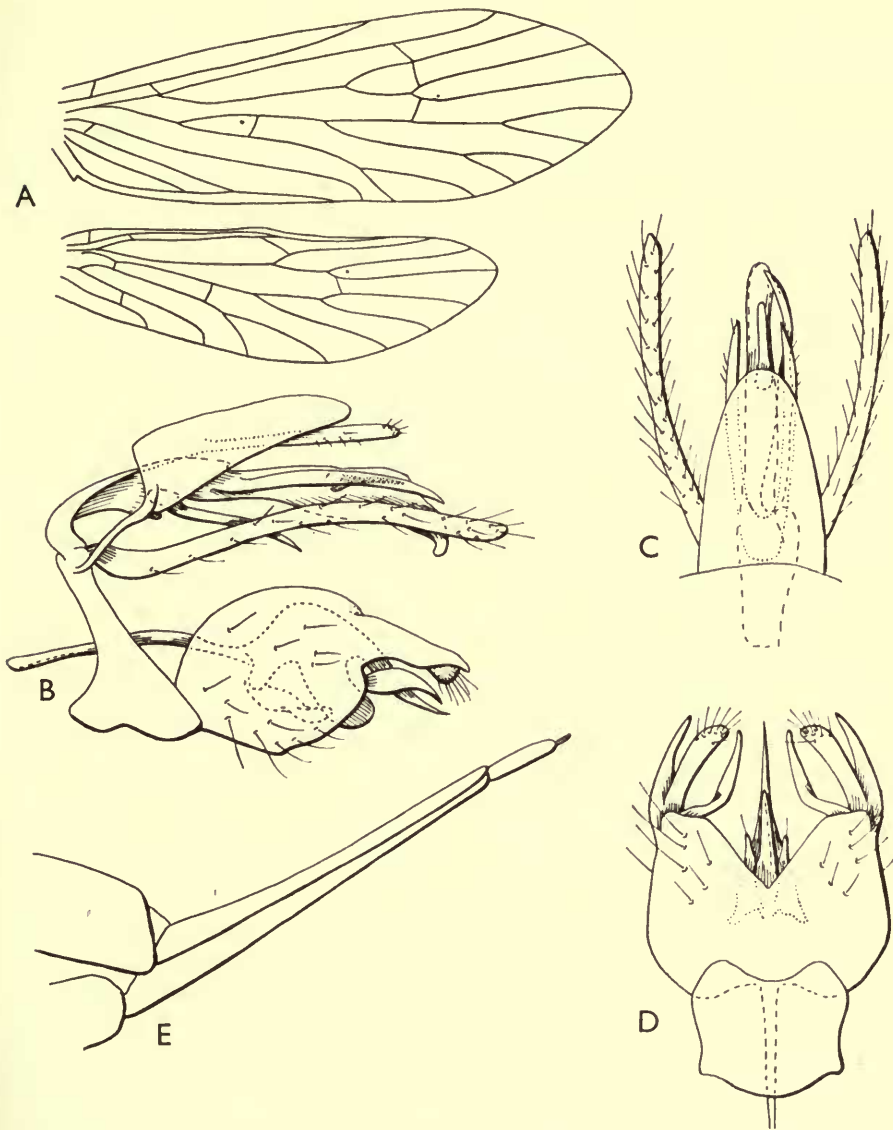


FIG. 34. *Tinodes aberrans* sp. n. A, ♂ wings; B, ♂ genitalia, lateral; C, ♂ ninth and tenth segments, paraprocts, cerci and aedeagus, dorsal; D, ♂ claspers, ventral; E, ♀ genitalia, lateral.

Ecnomus cyclopicus sp. n.

(Text-fig. 35)

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, I ♂; Cyclops Mts., Sabron, Camp 2, 2,000 ft., vii. 1936, I ♂.

Spurs 3.4.4. Head tawny, with golden hairs; antennae luteous; palpi dark tawny. Thorax tawny, legs fulvous. Fore wing with sparse golden pubescence, membrane brownish, with hyaline spots.

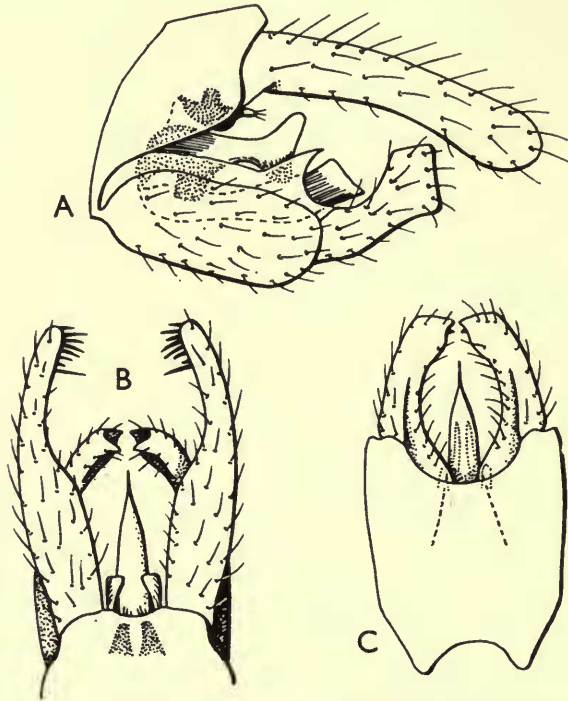


FIG. 35. *Ecnomus cyclopicus* sp. n. ♂ Genitalia. A, lateral; B, dorsal; C, claspers and aedeagus, ventral.

♂ GENITALIA. Cerci elongate, about three times as long as upper part of ninth segment, digitate and slightly downcurved in side view, from above slightly incurved, apical half about half as wide as basal and armed apically with stout, black teeth. Paraproctal processes short, digitate, with an apical tuft of bristles. Parameres about two-thirds as long as aedeagus, clavate apically in side view, tapering to a thin plate in dorsal. Clasper shorter than lower half of ninth segment, in side view with a deep rounded excision of upper margin, apex truncate, upper and lower angles produced inwards in acute teeth.

Length of fore wing, ♂, 5 mm.

♂ HOLOTYPE (iii. 1936) mounted as microscope preparations, paratype pinned, abdomen in glycerine. This species resembles *E. papuanus* Ulmer in the long, digitate cerci, but the claspers are quite differently formed.

Family **HYDROPSYCHIDAE**Subfamily **OESTROPSINAE***Oestropsyche vitrina* (Hagen)

PAPUA : Kokoda, 1,200 ft., v, vii-ix. 1933, 1 ♂, 31 ♀.

Previously recorded from Ceylon, Java, Sumatra, Borneo, Celebes, China, Philippines and New Guinea.

Macronema saundersi McLachlan

PAPUA : Kokoda, 1,200 ft., vii, x. 1933, 4 ♂.

Previously recorded from Mysol Island, New Guinea.

Macronema lorlai Navás, 1930 (*nec* 1933)

PAPUA : Kokoda, 1,200 ft., v-viii. 1933, 16 ♂, 3 ♀.

DUTCH NEW GUINEA : Lake Sentani, Ifar, viii. 1936, 1 ♂, 4 ?, all determined by M. E. Mosely.

Previously recorded from New Guinea.

Subfamily **HYDROPSYCHINAE***Hydropsyche moselyi* sp. n.

(Text-fig. 36)

Hydropsyche hobbyi Mosely, 1931, *Ann. Mag. nat. Hist.* (12) 4 : 484-487 (*partim*, Papuan examples) *nec* figs. 9-12.

PAPUA : Kokoda, 1,200 ft., iv-v, vii-x. 1933, 3 ♂, numerous females.

Head fulvous, with golden pubescence. Antennae fulvous basally, with fuscous annulations, becoming progressively more fuscous towards the apices. Palpi fulvous. Thorax and legs fulvous, with golden hairs and pubescence. Abdomen brownish. Fore wing with brownish and golden pubescence, the latter forming numerous small irrorations.

♂ GENITALIA. Ninth tergite moderately elevated at its centre. Side-pieces tapering to bluntly rounded apices. Tenth segment long and narrow from the side, apex with a pair of short, downcurved fingers. From above, it is moderately broad, with a rounded excision between the apical fingers, which are also incurved. Aedeagus trifid at its apex, the centre branch being an upcurved spine, longer than the side branches. The latter curve upwards and outwards and terminate in bifid apices. From the upper surface of the aedeagus, just basad of the three branches, two pairs of membranous processes arise from a common base. One pair is directed apically and terminates in a bunch of spines, the other pair directed basally along the stem of the aedeagus, ending in bifid claws. Clasper elongate, slender, basal segment more than three times as long as the rather sinuous terminal segment.

♀ GENITALIA. No reticulate patches on pleurites of abdominal segments. Lateral lobe of eighth sternite tapering to a rounded apex. Clasper receptacle of ninth tergite small, its opening further

restricted by a median ridge running into the receptacle. Lateral lobe of ninth segment short and deep. Lower angle of tenth segment rectangular.

Length of fore wing, ♂, 7.5-8 mm., ♀, 7-9 mm.

♂ HOLOTYPE and ♀ allotype pinned, both with abdomens cleared and in glycerine, paratypes pinned. This species is closely related to *Hydropsyche hobbyi* Mosely, but I

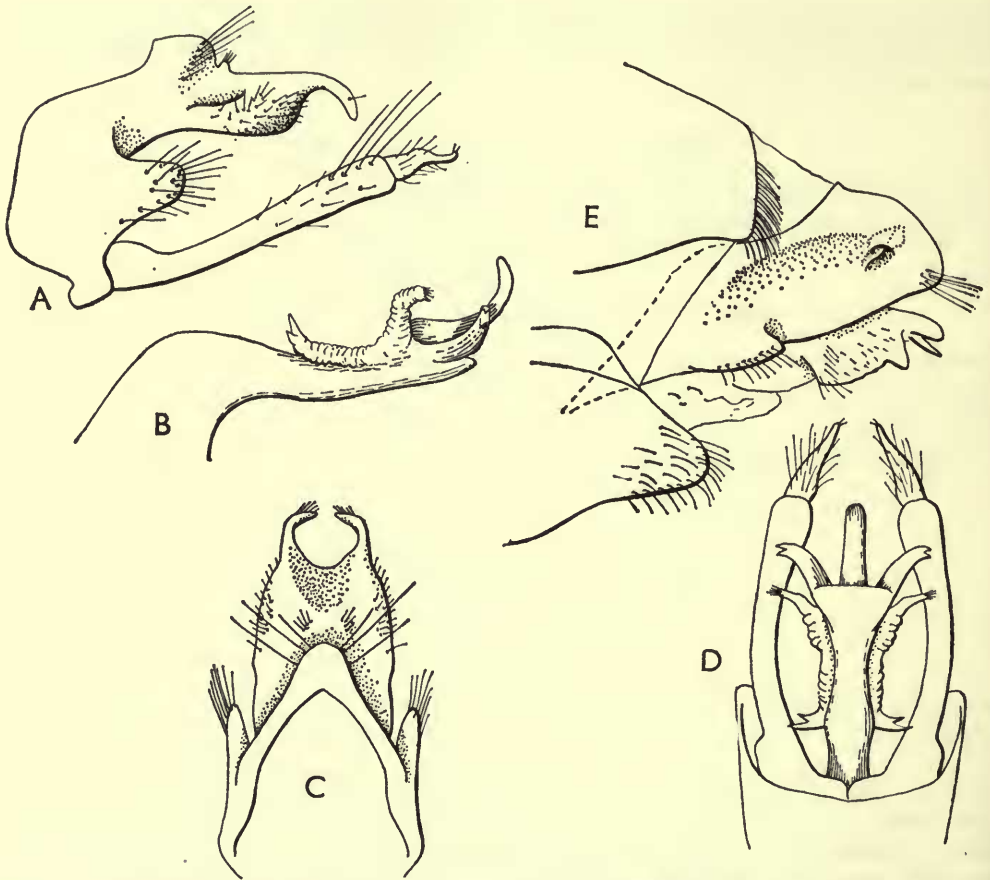


FIG. 36. *Hydropsyche moselyi* sp. n. Genitalia. A, ♂, lateral; B, ♂, aedeagus, lateral; C, ♂, ninth and tenth segments, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ lateral.

feel sure that had Mosely made a preparation of a Papuan male, he would not have considered it conspecific. In the male, the apical processes of the tenth segment are shorter and more abruptly turned down. The outer apical branches of the aedeagus are out-turned and bifid and the pre-apical armature is different, consisting of two (not three) pairs of processes. The nine females from Dutch New Guinea, Sabron, referred to by Mosely are rather larger and show slight differences in terminalia. I think it better to consider them as an unidentified species of *Hydropsyche*.

***Herbertorossia excavata* sp. n.**

(Text-fig. 37)

PAPUA : Kokoda, 1,200 ft., iv-ix. 1933, 18 ♂, numerous females.

Head pale fulvous, with golden pubescence. Maxillary palp pale fulvous, fifth segment a little shorter than the third and fourth together. Antennae slender, pale fulvous, faintly annulated with fuscous. Thorax pale fuscous, with golden pubescence. Legs fulvous, anterior tarsus of male with outer claw very much enlarged. Abdomen fuscous. Fore wing clothed with short golden pubescence and with numerous spots of paler pubescence. These small spots have their hyaline counterparts in the yellowish brown wing membrane.

♂ GENITALIA. Dorsal margin of ninth segment produced in a triangle, with a narrowly excised apex. Tenth segment from the side deep, its upper margin deeply excised, upper and lower apical angles rounded and setose. From above, the tenth segment is short and broad, the upper and lower apical angles appearing as rounded lobes, the upper ones separated by a small excision. Aedeagus constricted before its apex, which carries two pairs of lobes, the outer ones large and enclosing the inner. Clasper moderately long, basal segment only slightly longer than the tenth segment. Terminal segment rather less than half the length of the basal, narrowed and incurved, its apex slightly dilated and carrying a number of short teeth.

♀ GENITALIA. Pleural membranes of segments four and five with reticulated areas above the spiracles, that on the fourth the larger and quadrate, the fifth circular. The lower apical angle of eighth tergite hooked downward. Clasper receptacle of ninth tergite moderately long, with a wide mouth, tapering to a rounded apex. Clasper groove broad and indefinite. Lateral lobe of ninth tergite lightly sclerotized, rounded. Lower angle of tenth tergite rounded.

Length of fore wing, ♂, 7-9 mm., ♀ 8-10 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with abdomen cleared and in glycerine, paratypes pinned. This species differs from *H. unguolata* (Ulmer) in the relatively shorter and stouter claspers and the shorter tenth segment, which is broader apically and has a deeply excavate dorsal margin in side view.

***Herbertorossia sabronensis* sp. n.**

(Text-fig. 38)

DUTCH NEW GUINEA : Cyclops Mts., Sabron, 930 ft., iv-vi. 1936, 3 ♂, 5 ♀ ; Sabron, Camp 1, 1,200 ft., 15-22. v. 1936, 3 ♀ ; Camp 2, 2,000 ft., vii. 1936, 6 ♂, 2 ♀.

General appearance much as in *H. excavata* sp. n.

♂ GENITALIA. Similar in pattern to *H. excavata* sp. n., but differing in detail. The excavation of the dorsal margin of the tenth segment is rather narrower and the tenth segment itself in side view is more slender, the upper apical angle smaller and more rounded. Lower apical angles less pronounced. From above, the produced part of the ninth segment is more acute, not bifid, and the lateral hollows deeper ; the tenth segment tapers to a narrower apex. Aedeagus less constricted before the apex, terminal lobes obliquely truncate in side view instead of rounded. In ventral view these lobes are triangular rather than reniform. Clasper more slender, basal segment three times as long as terminal.

♀ GENITALIA. Pleurites of the fourth to sixth segments with elongate-oval reticulated areas, that on the fifth being the largest and the sixth the smallest. Lip of the clasper receptacle produced in a small lobe at its centre. Clasper groove shallow. Lateral lobe of ninth tergite rounded. Tenth segment short and deep, lower angle produced in a rounded lobe.

Length of fore wing, ♂, 8.5 mm., ♀, 9 mm.

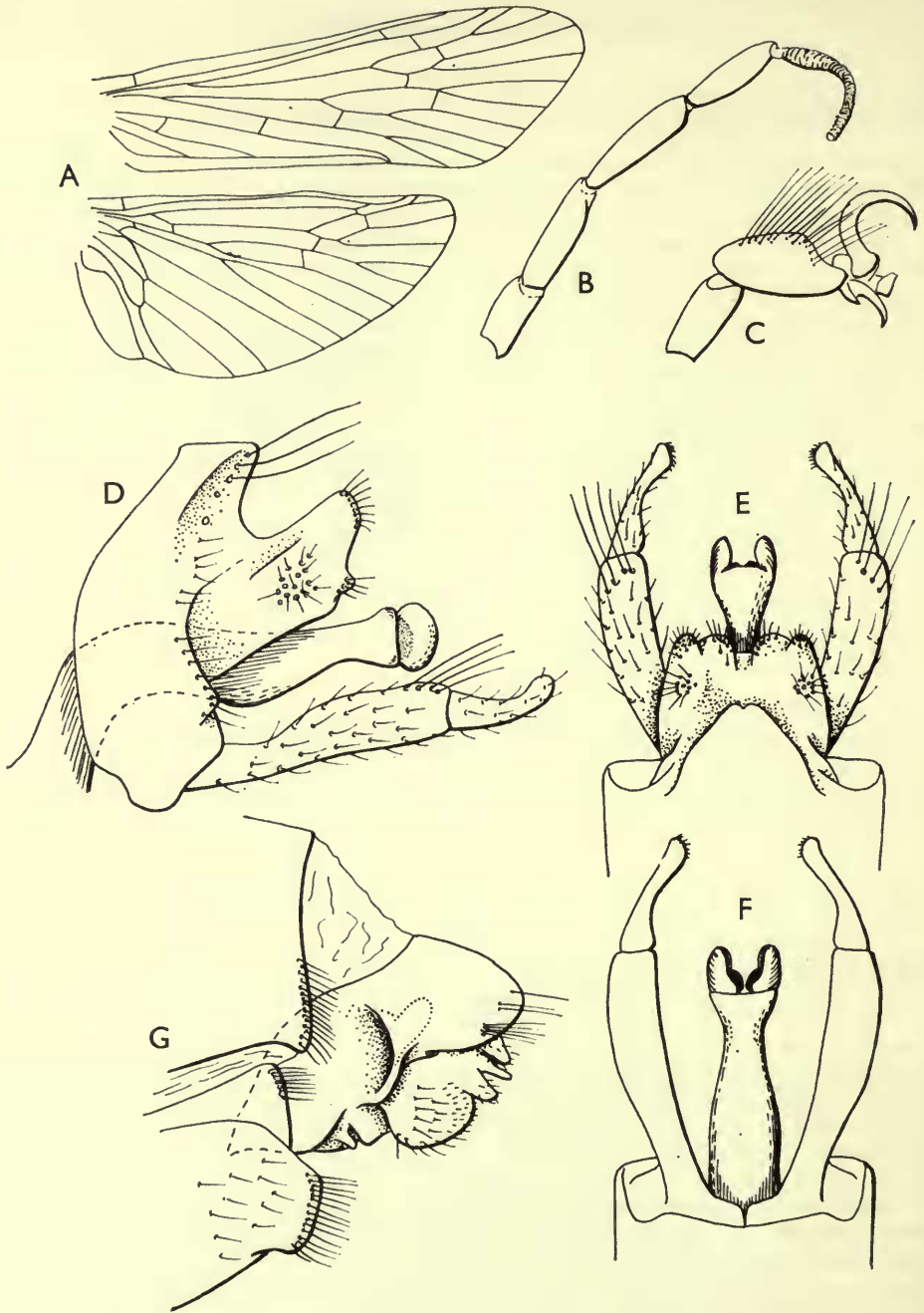


FIG. 37. *Herbertorossia excavata* sp. n. A, wings; B, ♂, apex of fore tarsus; C, maxillary palpus; D-G, genitalia; D, ♂, lateral; E, ♂, dorsal; F, ♂, claspers and aedeagus, ventral; G, ♀, lateral.

♂ HOLOTYPE and ♀ allotype (Sabron, 930 ft.) pinned, abdomens cleared and in glycerine, paratypes pinned. This species is closely related to *H. excavata* sp. n., and the differences in male genitalia are noted above. The difference in the shape of the

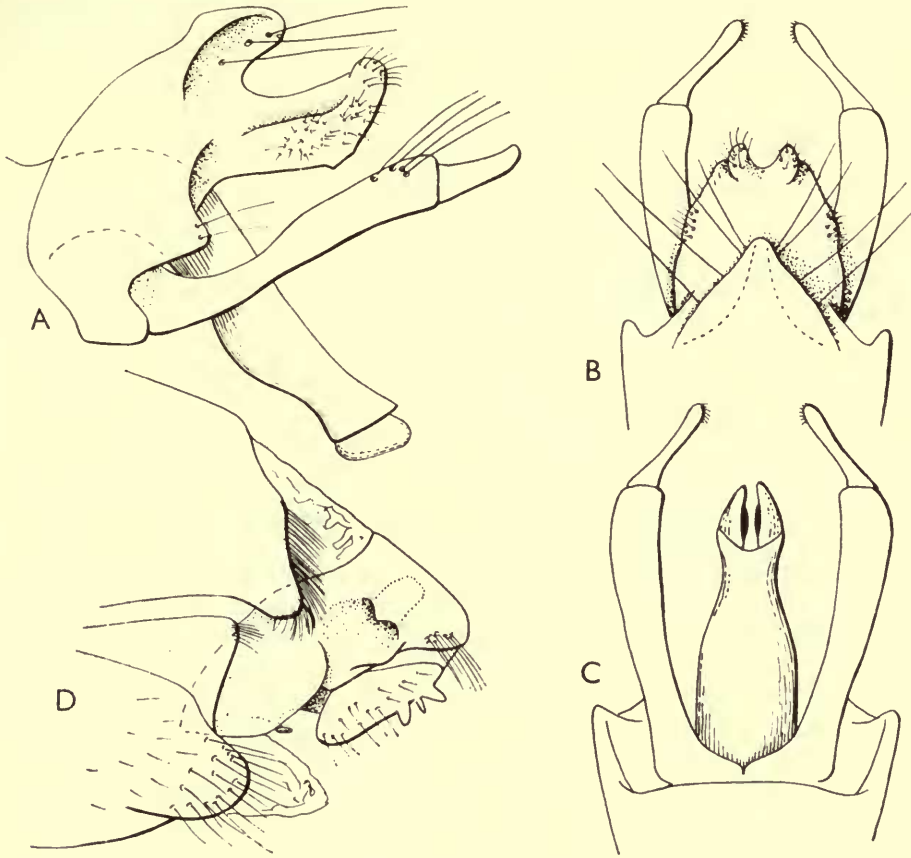


FIG. 38. *Herbertorossia sabronensis* sp. n. Genitalia. A, ♂, lateral; B, ♂, dorsal; C, ♂, claspers and aedeagus, ventral; D, ♀, lateral.

tenth segment can generally be made out in the pinned examples, although it is of course more evident in a cleared preparation. The females may be distinguished by the shape of the eighth tergite, the clasper receptacle and the tenth tergite.

***Herbertorossia striata* sp. n.**

(Text-fig. 39)

PAPUA: Kokoda, 1,200 ft., v. 1933, 1 ♂; Mondo, 5,000 ft., i-ii. 1934, 1 ♂.

Head fulvous, with golden pubescence. Antennae luteous, with faint brownish annulations. Palpi fulvous. Thorax fulvous, with golden pubescence. Legs and abdomen fulvous. Enlarged

claw of fore tarsus of male almost straight. Fore wing with numerous spots of pale golden pubescence on a brown ground, the base, costal and anal margins being largely pale golden. The brown pubescence forms a distinctive, slightly angled streak running along the first anal vein as far as the junction with the second anal vein, then bending obliquely forward to the posterior margin of the median cell, finally bending again to run through fork Cu_{1a} to the wing margin. Hind wing hyaline, with sparse golden pubescence. Venation of fore wing differing from that of

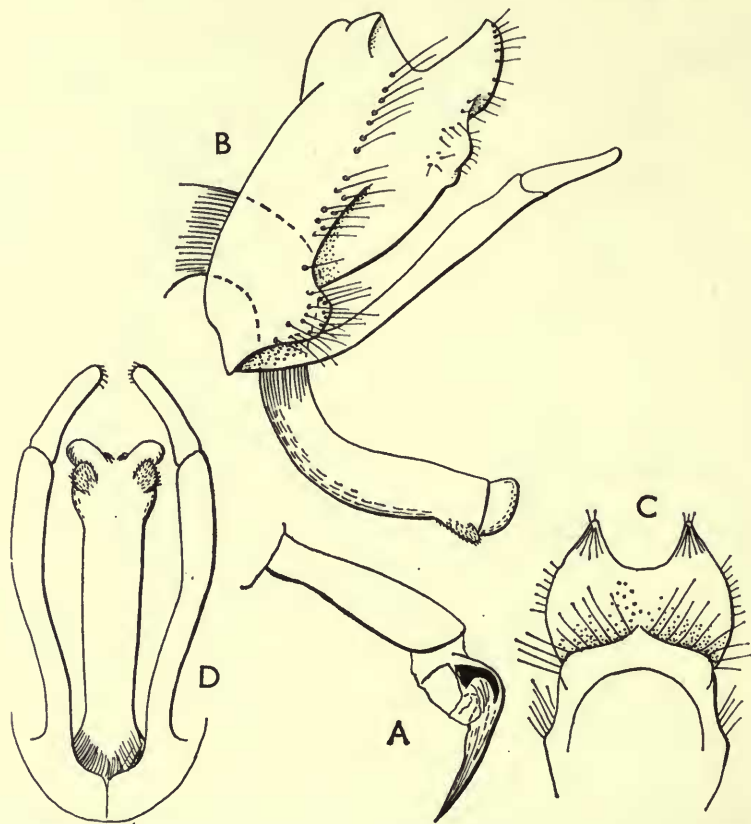


FIG. 39. *Herbertorossia striata* sp. n. ♂. A, fore tarsal claws; B, genitalia, lateral; C, ninth and tenth segments, dorsal; D, claspers and aedeagus, ventral.

H. excavata. Median cell short, about as long as discoidal. Fork R_2 with a short footstalk, fork M_1 about twice as long as its footstalk. In hind wing, discoidal cell rather short, median cell as in *excavata*.

♂ GENITALIA. Ninth segment short, apical margin only slightly produced in a shallow triangle. Tenth segment deep but short, margin forming a slightly sinuous convexity, upper angle pointed. From above, the upper angles are separated by a semicircular excision. Aedeagus long and slender, from the side sinuous, curving first downwards and then tailward. Apex slightly dilated in ventral view, with a pair of ventral setose lobes. Apical lobes convex, slightly longer above than below. Clasper long and slender, basal segment fully three times as long as terminal.

Length of fore wing, ♂, 8–10 mm.

♂ HOLOTYPE (Kokoda) pinned, with abdomen and fore leg in glycerine, ♂ paratype pinned. In the proportions of the clasper, this species approaches *H. unguolata* Ulmer, but differs from it and from the other described species in the almost straight enlarged tarsal claw of the ♂ fore leg, the sinuous aedeagus, the form of the tenth segment and the angled band of brown pubescence on the fore wing, from which the specific name is derived.

Herbertorossia orakaivai sp. n.

(Text-fig. 40)

PAPUA: Kokoda, 1,200 ft., v, vii, ix-x. 1933, 11 ♂, 10 ♀.

General appearance much as in *H. excavata* sp. n., but rather smaller, and with smaller and more numerous pale golden irrorations on the fore wing. Venation much as in that species, but fork M_1 in the fore wing with a slightly longer footstalk. Enlarged fore tarsal claw of ♂ as in *excavata*.

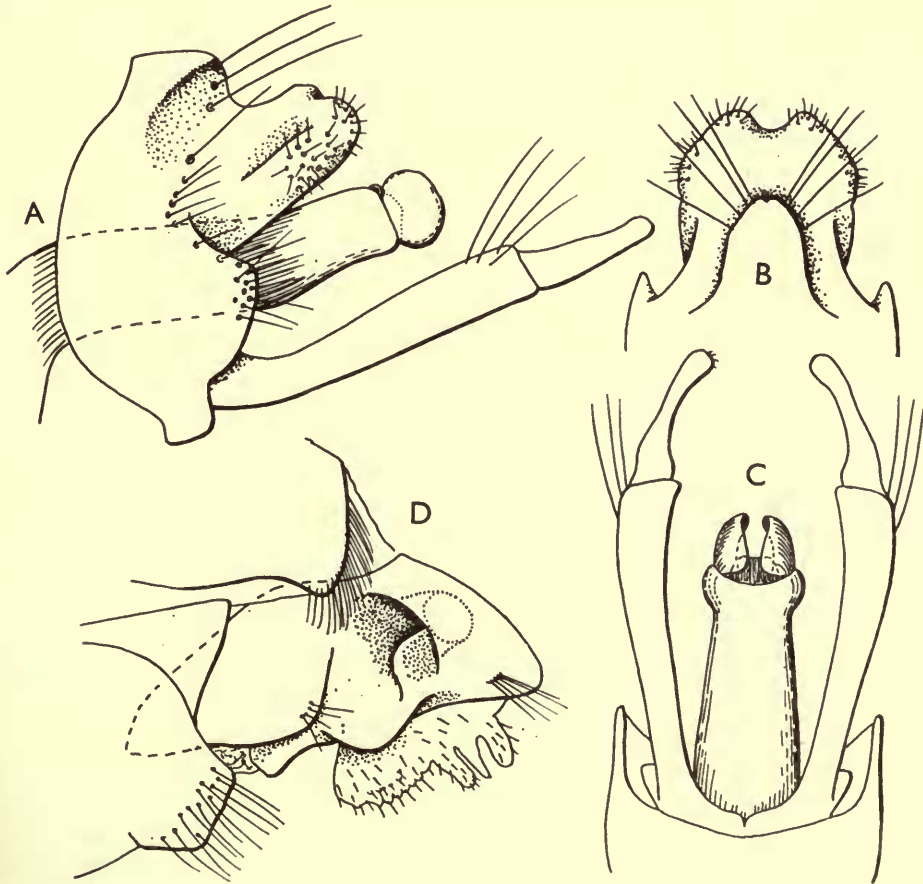


FIG. 40. *Herbertorossia orakaivai* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth segments, dorsal; C, ♂, claspers and aedeagus, ventral; D, ♀, lateral.

♂ GENITALIA. Similar in pattern to *H. excavata*. The dorsal excavation of the tenth segment in side view is shallow and the tenth segment is rounded apically without produced lower angle. Apical margin bilobed, with a rounded median excision. Aedeagus scarcely constricted before the apex, apical lobes ovate, much as in *excavata*. From beneath, the apex is somewhat clavate. Clasper with the basal segment about two and a half times as long as the terminal.

♀ GENITALIA. Pleurites of the fourth and fifth segments with reticulated areas. Clasper receptacle of ninth segment wider than in *excavata* and with a median ridge in the opening. The lobe below the opening of the receptacle more strongly developed, as is the lateral lobe. Lower part of tenth segment elongate, the hairs arising from elevated bases.

Length of fore wing, ♂, 6-7 mm., ♀, 7-8 mm.

♂ HOLOTYPE (v.33) and ♀ allotype (ix.33) pinned, abdomens cleared and in glycerine, paratypes pinned. The differences between this species and *H. excavata* are set out in the foregoing description. The specific name is derived from the Orakaiva tribe, which inhabits the plains around Kokoda.

Hydropsychodes expeditionis Ulmer

PAPUA: Kokoda, 1,200 ft., v-x. 1933, 22 ♂, 39 ♀.
Previously recorded from Papua.

Hydropsychodes cheesmanae sp. n.

(Text-fig. 41)

PAPUA: Kokoda, 1,200 ft., vii-ix. 1933, 7 ♂, 2 ♀.

Head fuscous, with golden pubescence above, that on the clypeus brownish. Palpi fuscous, with brownish pubescence. Antennae fuscous, towards the bases annulated with fulvous. Thorax fuscous, with golden pubescence. Legs fulvous, with golden pubescence. Abdomen fuscous, terminalia fulvous. Fore wing densely pubescent, brownish, with numerous golden spots. Hind wing with pale smoky membrane, sparsely pubescent.

♂ GENITALIA. Centre of margin of ninth segment elevated in a transverse ridge, fringed with long setae. Side-pieces rounded. Tenth segment forming a quadrate hood, shallowly trilobed apically in dorsal view, centre lobe triangular, elevated above the lateral lobes. A setiferous wart on each side towards apex. Aedeagus clavate apically, with large, convex, apical lobes. Clasper with long basal segment, terminal segment incurved, its inner surface somewhat hollowed.

♀ GENITALIA. Pleurite of fourth abdominal segment with a large reticulated area. Clasper receptacle guarded by a long flange or groove, opening small and ovate. Lateral lobe of ninth segment rudimentary. Tenth segment short and deep, lower angle rounded.

Length of fore wing, ♂, 7-7.5 mm., ♀, 6 mm.

♂ HOLOTYPE mounted as a microscope preparation, ♀ allotype pinned, with abdomens in glycerine, paratypes pinned. This species differs from *H. expeditionis* in its greater size, darker colour, shape of the tenth tergite and the relatively shorter, stouter terminal segment of the clasper. The two females are associated somewhat doubtfully with the males owing to their smaller size.

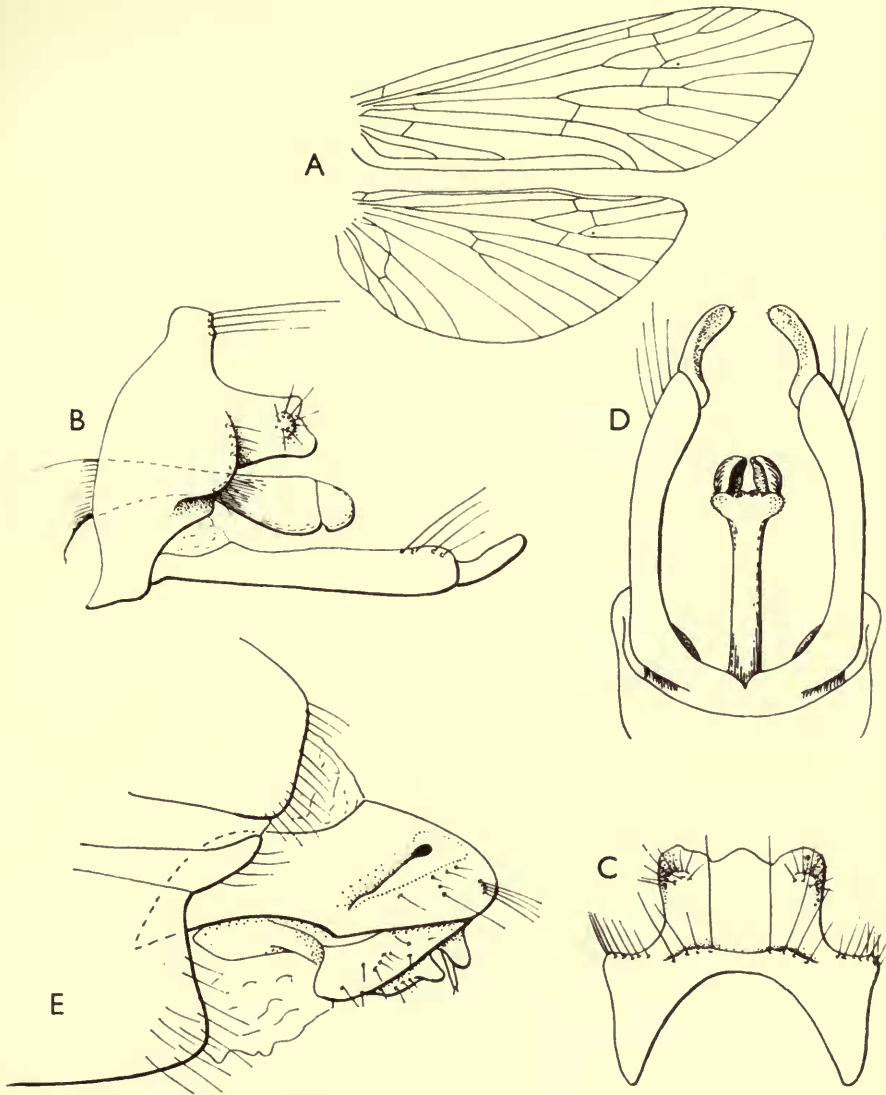


FIG. 41. *Hydropsychodes cheesmanae* sp. n. A, ♂ wings; B, ♂, genitalia, lateral; C, ♂, ninth and tenth segments, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ genitalia, lateral.

Abacaria subfusca sp. n.

(Text-fig. 42)

PAPUA: Kokoda, 1,200 ft., viii-ix. 1933, 3 ♂, 7 ♀.

Coloration pale fuscous, with golden hairs and pubescence. Fore wing membrane pale fuscous, with sparse (? denuded), uniform golden pubescence.

♂ GENITALIA. Ninth segment somewhat elevated in a dorsal triangle, whose apex is slightly excised. Side-pieces triangular, rather thick in dorsal aspect. Tenth segment short and deep, truncate apically in side view, upper apical angles each with a globular, hairy process, lower

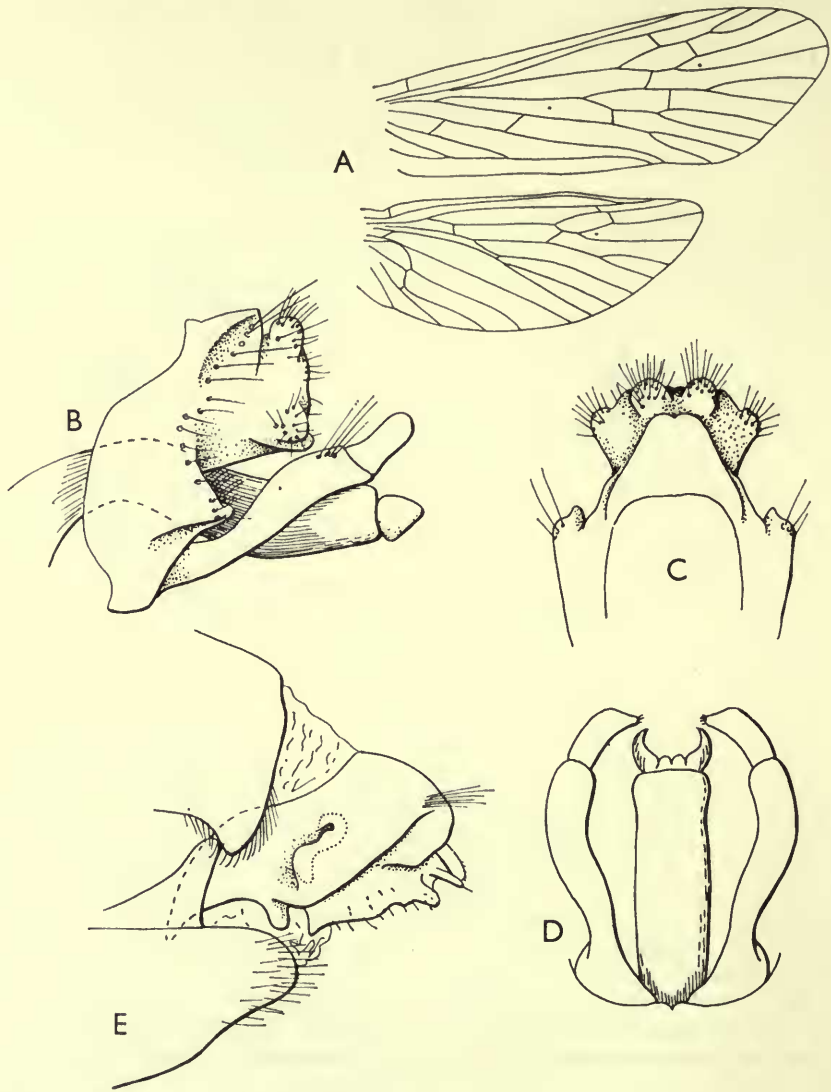


FIG. 42. *Abacaria subfusca* sp. n. A, ♂ wings; B, ♂, genitalia, lateral; C, ♂, ninth and tenth segments, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ genitalia, lateral.

apical angles produced outward in rounded, hairy lobes. Aedeagus cylindrical, sinuous in side view, slightly constricted before the apex in dorsal view, apical lobes triangular in side view, falcate dorsally. Clasper rather short, basal segment sinuous, slightly clavate apically, arising from a wide base in ventral aspect. Terminal segment short and incurved, tapering near apex to a short, setose finger.

♀ GENITALIA. Eighth tergite with apical margin widely excised in a V, lower apical angles produced downwards in lateral aspect. Pleurosternum of eighth segment strongly produced upwards in a triangle with rounded apex. Lobes of eighth sternite produced, with rounded apices, separated by a deep median excision. Clasper receptacle of ninth tergite moderately large, clasper groove largely covered by a sinuate flange on apical side. Lateral lobe of ninth tergite small, spatulate. Lower angle of tenth tergite acute. Inner margins of upper pair of apical processes more sclerotized.

Length of fore wing, ♂, 5 mm., ♀, 5-6 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine, paratypes pinned. This species has been placed in the genus *Abacaria* (hitherto recorded only from Fiji) on the wing venation and general pattern of male genitalia. The venation of *Abacaria* differs from that of *Hydropsychoedes* in having the *m-cu* and *cu* cross-veins in the fore wing widely distant from one another, and *M* and *Cu*₁ in hind wing running close together as far as the fork of *Cu*₁. In these characters it resembles *Hydropsyche*, from which it differs in the absence of fork *R*₂ in the hind wing. From *A. fijiana* and *A. ruficeps*, the male may be distinguished by the more truncate tenth segment and different apical lobes of the aedeagus, and by its smaller size and unmarked wings in both sexes.

Abacaria sp.

PAPUA: Kokoda, 1,200 ft., v, viii-ix. 1933, 3 ♀.

These three specimens are not referred to *A. subfusca* on account of their much greater size (fore wing 8-9 mm.), although in general appearance they are similar.

Subfamily DIPLECTRONINAE

Diplectrona mafulua sp. n.

(Text-fig. 43)

PAPUA: Mafulu, 4,000 ft., i. 1934, 1 ♂.

Head luteous, with golden hairs. Eyes rather large, inter-ocular distance about equal to radius of eye in dorsal view. Antennae defective, luteous, becoming more brownish towards apices. Palpi luteous. Thorax and abdomen fulvous. Legs luteous. Fore wing membrane hyaline, sparsely pubescent, mainly golden but faintly brownish along anal margin and with a faint band crossing the centre of the wing from arculus to the pterostigma. Hind wing hyaline.

♂ GENITALIA. Lateral filaments of fifth segment only as long as segment. No internal reticulated bodies but in the base of the eighth pleurite there is a small, spherical pocket, the membranous walls of which exhibit transverse wrinkles. Dorsal surface of ninth segment divided longitudinally by a narrow membranous area. Side-pieces scarcely developed. Tenth segment in side view somewhat triangular, upper margin convex. Near the lower basal angle is an oblique flange, fringed with hairs. From above, the apical margin is widely excised, with a small notch marking off the outer apical angle, which is spatulate. Aedeagus short, with a heavily clubbed apex, from which arises two pairs of processes. Clasper slender, basal segment much longer than apical.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species resembles *D. dulitensis* Kimmins (Sarawak) in possessing a single pair of pockets at the base of the

eighth pleurite. In *dulitensis* the pocket is narrower and less spherical than in *mafulua*. In the original description of *dulitensis*, this pocket was described as reticulated, but on

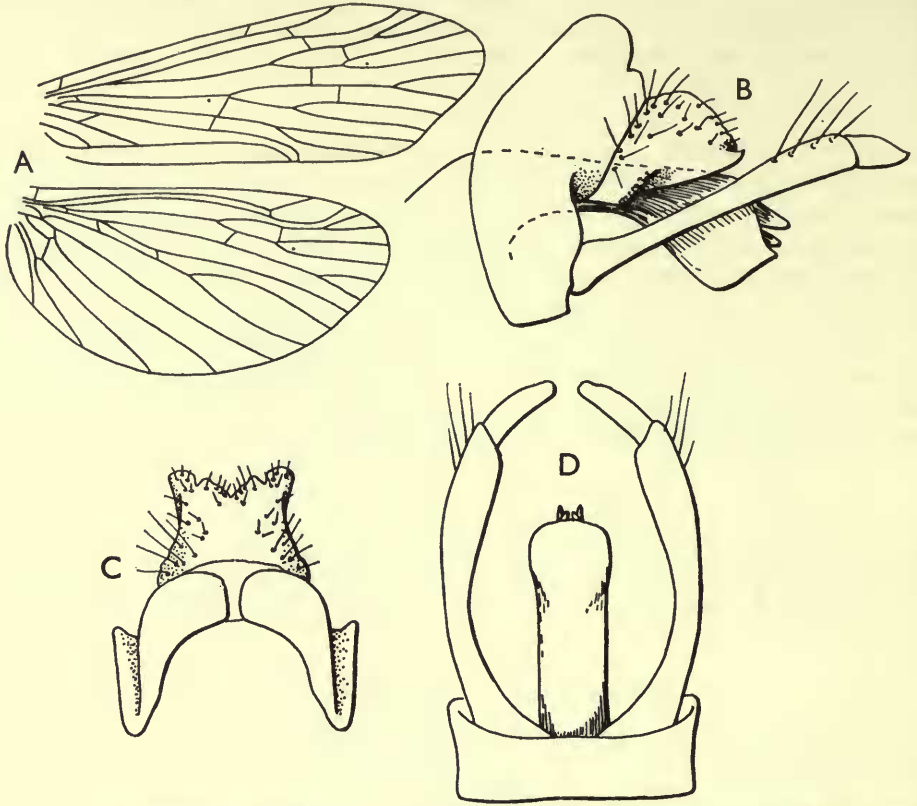


FIG. 43. *Diplectrona mafulua* sp. n. ♂ A, wings; B, genitalia, lateral; C, ninth and tenth segments, dorsal; D, claspers and aedeagus, ventral.

re-examination I consider that ridged or wrinkled would be a more accurate description. In genitalia, although following the same general pattern, the detailed construction is quite distinct.

Family CALAMOCERATIDAE

Subfamily ANISOCENTROPODINAE

Anisocentropus io sp. n.

(Text-figs. 44-45)

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v-vi. 1936, 2 ♂.

Head fulvous, with golden pubescence, vertex shining. Antennae fulvous at base, with narrow, whitish, apical annulations. These annulations become progressively larger towards midway,

then decrease towards apex of antenna. Palpi with fulvous and piceous pubescence. Thorax fulvous, with golden pubescence. Fore wing densely pubescent, with a striking oculate spot in basal half of wing. The pubescence is dark brown, pale brown and cream, and there are also areas of iridescent, scale-like hairs, pale blue in the apical half of the wing and a more lilac-blue in the basal half. The pattern of the wing is shown diagrammatically in Text-fig. 44. This

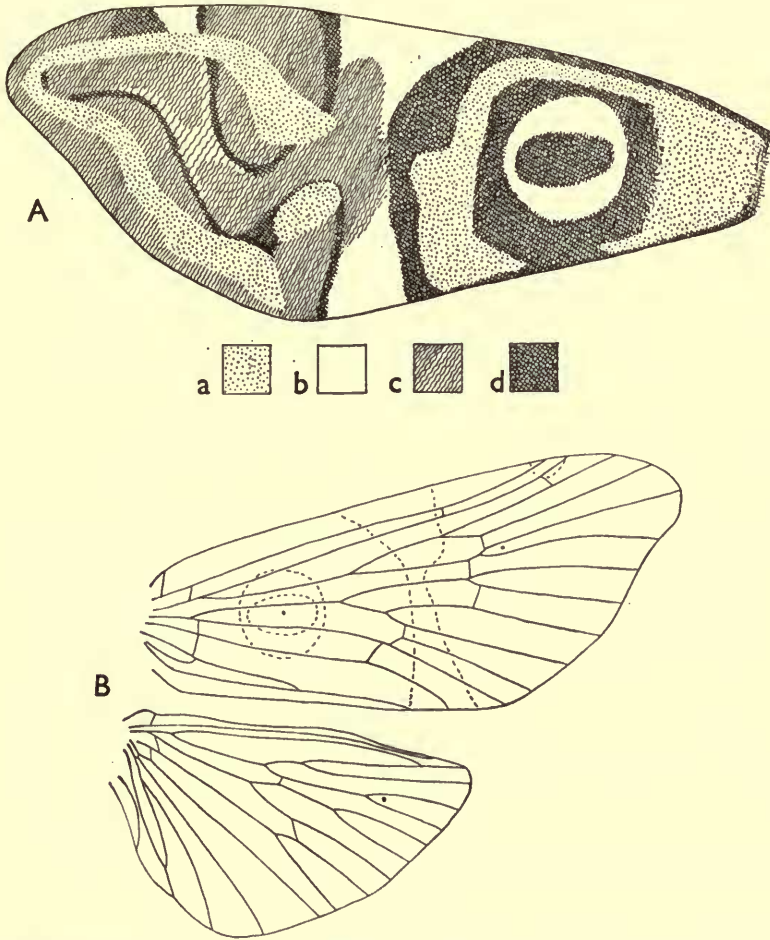


FIG. 44. *Anisocentropus io* sp. n. Wings. A, pattern of fore wing; B, ♂ wings. (a = iridescent blues, b = cream, c = pale brown, d = dark brown.)

diagram was drawn from an unmounted wing and the base therefore appears slightly narrower than in the wing venation figure, which was taken from a prepared and flattened wing. The cream areas have their hyaline counterpart in the brownish membrane of the wing. Apex slightly falcate. Abdomen brownish.

♂ GENITALIA. Ninth segment with short, truncate side-pieces, ventral apical margin widely excised at its centre. Tenth segment fused to ninth, forming a large, transverse hood, deep from the side, apical angles hooked downwards, a small excision at centre of apical margin. Cercus short and digitate. Aedeagus short and cylindrical. Clasper single-segmented, short,

triangular in side view. From beneath, it is divergent, inner margin dilated, armed with short spines. Apex of clasper slender and digitate.

Length of fore wing, ♂, 10 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. In venation of fore wing this species is related to *A. triangulatus* Ulmer, especially in the origin of fork M_3 , which arises before the middle of the median cell. Both species show a sinuously falcate apex. The hind wing of *A. io* sp.n. is much wider (possibly a sexual

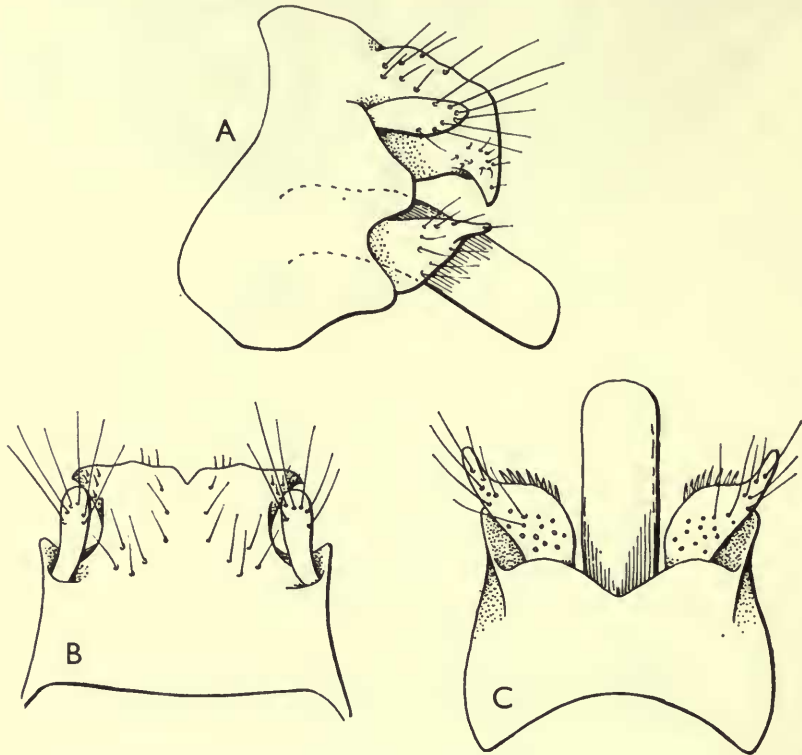


FIG. 45. *Anisocentropus io* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth segments, dorsal; C, claspers and aedeagus, ventral.

character) but the venation resembles that of *A. triangulatus* Ulmer. It differs in the striking cream-coloured eye-spot, with its dark brown pupil in the basal half of the fore wing.

Anisocentropus triangulatus Ulmer

PAPUA: Kokoda, 1,200 ft., ix. 1933, 1 ♀, det. M. E. Mosely.

This female differs from Ulmer's figure in having the apical pale triangle of the fore wing much smaller, more as in *A. io* sp. n. There is however no trace of the eye-spot of that species, either in vestiture or in membrane pattern.

Previously recorded from Fergusson Island.

Anisocentropus sp.

DUTCH NEW GUINEA : Cyclops Mts., Sabron, 930 ft., v-vi. 1936, 1 ♂ ; Mt. Cyclops, 3,500 ft., iii. 1936, 1 ♂.

These two males, of a fairly uniform testaceous colouring, differ from one another slightly in size and wing shape. One is rather denuded, the other has a fine, transverse,

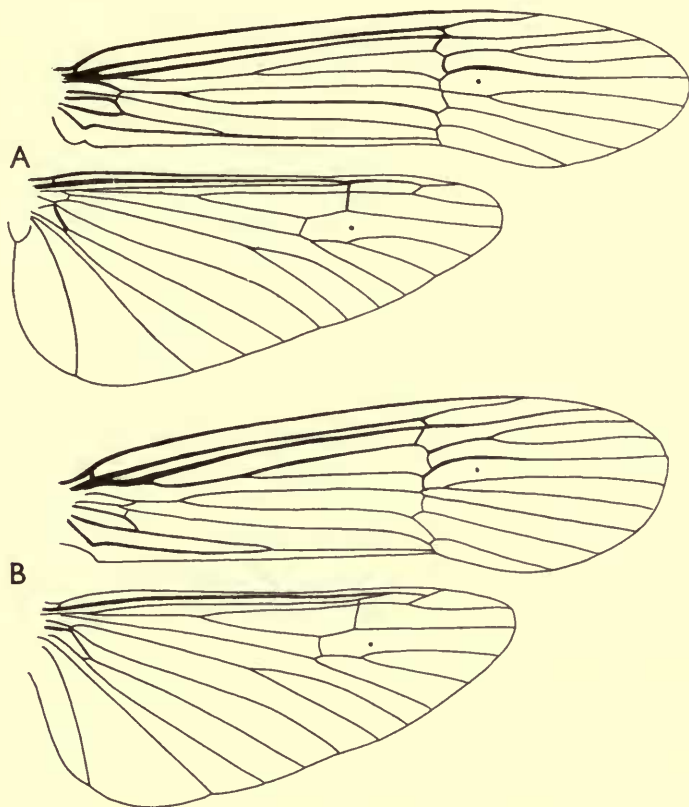


FIG. 46. *Notanatolica gilolensis* McLachlan. Wings of A, ♂ from Kokoda ; B, ♀ type, Halmaheira.

pale line across the fore wing just before the arculus. They also differ slightly in genitalia, though of the same general pattern as *A. io*. In view of the inadequacy of the material, they are left undetermined.

Anisocentropus dilucidus McLachlan

PAPUA : Mondo, 5,000 ft., i-ii. 1934, 1 ♂, det. M. E. Mosely.
Previously recorded from New Guinea.

Family **LEPTOCERIDAE**
 Subfamily **TRIPLECTIDINAE**
Notanatolica gilolensis McLachlan

(Text-figs. 46-47)

WEST NEW GUINEA: Njau-limon, S. of Bougainville, 3,000 ft., ii. 1936, 1 ♂.
 PAPUA: Kokoda, 1,200 ft., vi-vii. 1933, 1 ♂, 2 ♀.

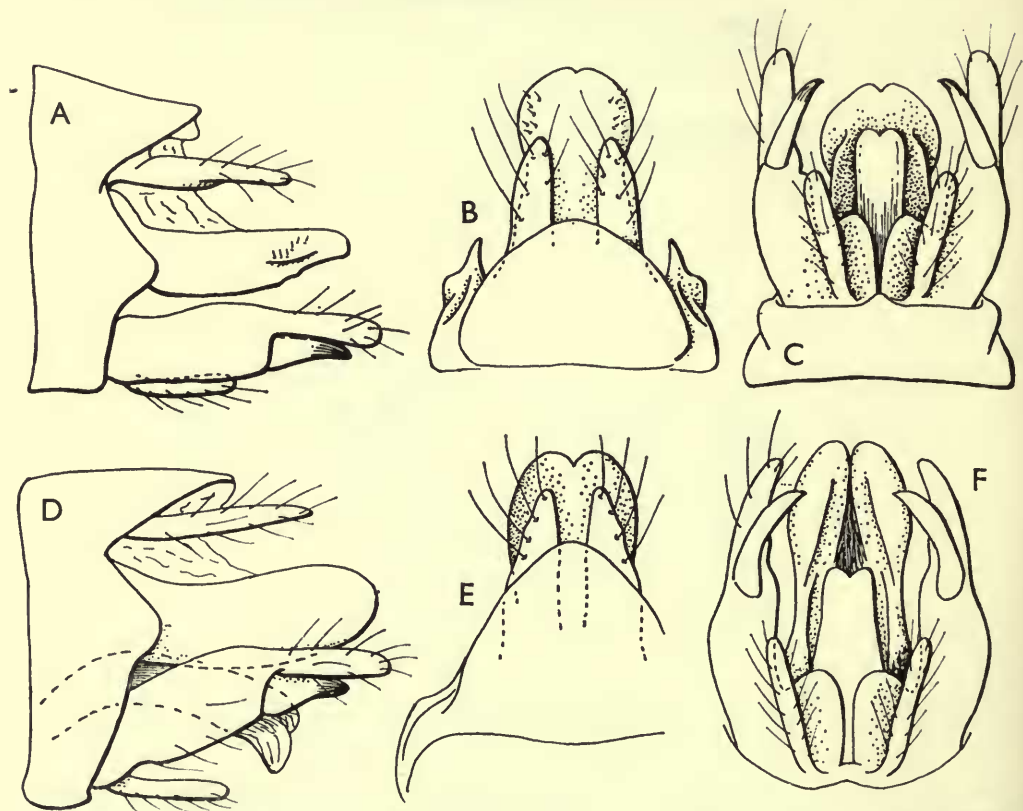


FIG. 47. *Notanatolica gilolensis* McLachlan. A-C, Genitalia (♂ Kokoda), A, lateral; B, ninth and tenth segments, dorsal; C, claspers, aedeagus and tenth segment, ventral; D-F, genitalia of ♂ allotype. Details as figs. A-C.

Mosely, in his 1936 *Revision of the Triplectidinae*, gives a fairly wide distribution for this species, based upon published records as well as on material in the British Museum (Nat. Hist.). Ulmer, in his 1951 *Trichoptera of the Sunda Islands*, quotes some correspondence which he had with Mosely as to the correctness of some of these records. I have studied the material in our collection and fully agree with Ulmer that much of it was misidentified. The examples from N. Borneo, Java and North

Australia determined by Banks belong to the *N. magna* group and the examples from Fiji and Dutch New Guinea determined by Mosely are also misidentified.

Since the type of *N. gilolensis* (a female) is so little known, I am figuring the wing venation, from which it will be seen that the discoidal cell in the fore wing is much longer and narrower than in the *magna* group of species, being about two-thirds as long as the thyridial cell. The fore wing, contrary to the statement made by Mosely, is not narrower than in *magna* when the wing has been properly flattened for drawing. In pinned specimens, the wing does tend to appear narrower, due partly to the deflexing of the anterior and posterior margins. In the hind wing, $Sc-R_1$ clearly terminates in R_2 and not in the wing margin. This also occurs (though less clearly) in the wing of the male figured by Mosely as the male of *gilolensis*, his fig. 43 being inaccurate.

Comparison of the male genitalia of the examples collected by Miss Cheesman with the male figured by Mosely shows slight individual differences in each specimen, chiefly in the shape of the tenth segment and degree of development of the ridges on its ventral surface. In the male allotype, the sides of the segment slope downwards at a steeper angle, making it appear deeper in side view and narrower in ventral view. In view of the limited material available (3 ♂) it would seem unjustified to consider these differences as more than individual variations, especially as considerable variation is known to occur in *magna*. Figures are given of the allotype and of the Kokoda males.

In addition to the holotype female and the material collected by Miss Cheesman, three males from the McLachlan collection enable the distribution to be given as Halmahera (Gilolo); New Guinea; Wetter Island and Ternate.

[*Notanatolica ?ciuska* (Mosely)]

DUTCH NEW GUINEA: Canoe Camp, Utaqua River, xii.1912, 2 ♂, 2 ♀, A. F. R. Wollaston, *Triplectides gilolensis* McL., det. M. E. Mosely.

The males agree reasonably well in terminalia with the type of *ciuska*, but are rather paler (? faded).

Previously recorded from New South Wales and Queensland.

Symphitoneurina fulva (Navás)

PAPUA: Mafulu, 4,000 ft., i.1934, 1 ♂.

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v-vi.1936, 2 ♂; 1,200 ft., 22.v.1936, 1 ♀; Camp 2, 2,000 ft., vii.1936, 9 ♂, 4 ♀.

Previously recorded from New Guinea.

Symphitoneura sp.

PAPUA: Matsika, 3,000 ft., xii.1933, 1 ♂.

In view of the poor condition of the single example, it is not proposed to identify it more precisely.

Subfamily LEPTOCERINAE

Leptocerus cheesmanae sp. n.

(Text-fig. 48)

PAPUA : Kokoda, 1,200 ft., ix. 1933, 4 ♂.

All four specimens are in rather poor condition, but the male genitalia are sufficiently distinctive to warrant the description of a new species. Head black, with black and white pubescence. Antennae incomplete, basal segments fuscous, with white annulations. Palpi fuscous, with white pubescence. Thorax black. Legs fuscous. Fore wing fuscous, with black pubescence. There are two patches of white pubescence along the anterior margin and behind them and along the posterior margin are areas of broadened, silvery hairs. Hind wing with sparse fuscous pubescence.

♂ GENITALIA. Ninth segment cut back dorsally, where it is fused with the tenth. Apical margin of ninth sternite with a broad, shallow excision. Tenth segment forming a moderately narrow projection, extending beyond the ninth sternite and in dorsal view slightly dilated about midway. From its under surface project two asymmetric, apically bifid spines, each with a small digitate process at its base. Cerci absent (or fused with tenth segment). Aedeagus rather difficult to make out without dissection. On its dorsal surface towards the base, and flexibly attached to it by membrane, are two asymmetric, spiniform parameres. The left-hand and larger is strongly hooked downwards at its apex and the right-hand paramere is slender and only slightly sinuous. The aedeagus itself is twice sharply angled in side view, the apical part tapering and laterally compressed ventrally. At the more basal angulation arises, on each side, a slender spine which curls caudad along the aedeagus and shortly exceeds it in length, the apices of the two spines contiguous. Claspers fused basally, from the side dilating to a clavate apex, which is divided into a slender upper and a broad lower part. From beneath, the fused claspers are broad, the apical margin with a median excision, which is wider at its base. The apical margins and upper surface are armed with strong, socketed teeth and in dorsal view there is a median, cordate depression, also filled with socketed teeth.

Length of fore wing, ♂, 5.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratypes pinned. The markings of the fore wing are of a pattern which occurs in a number of species in Africa and Asia, such as *L. argentonigra* (Ulmer), Ceylon, and *L. canaliculata* (Ulmer), Philippines. The male genitalia of *L. cheesmanae* sp. n. show some resemblance to those of the latter species, in possessing a digitate upper branch to the clasper, but the relationship is not very close.

OECETIS McLachlan

Most of the Papuan species placed in this genus form a fairly compact group, characterized by having the so-called *r-m* cross-vein in the hind wing located beyond the fork of *M*, instead of basad of it as in the typical species of *Oecetis*. This cross vein is of course the basal part of *R*₅, the remainder of the vein being fused with *M* or with *M*₁₊₂. The position of this vein was used by Ulmer as a character when erecting his genus *Oecetodes* (type-species *Setodes avara* Banks, 1895). The same character occurs also in the following genera: *Oecetodella* Ulmer (type-species *Oecetodella singularis* Ulmer, 1930), in Milne's subgenera *Quaria* and *Yrula*, and in various other

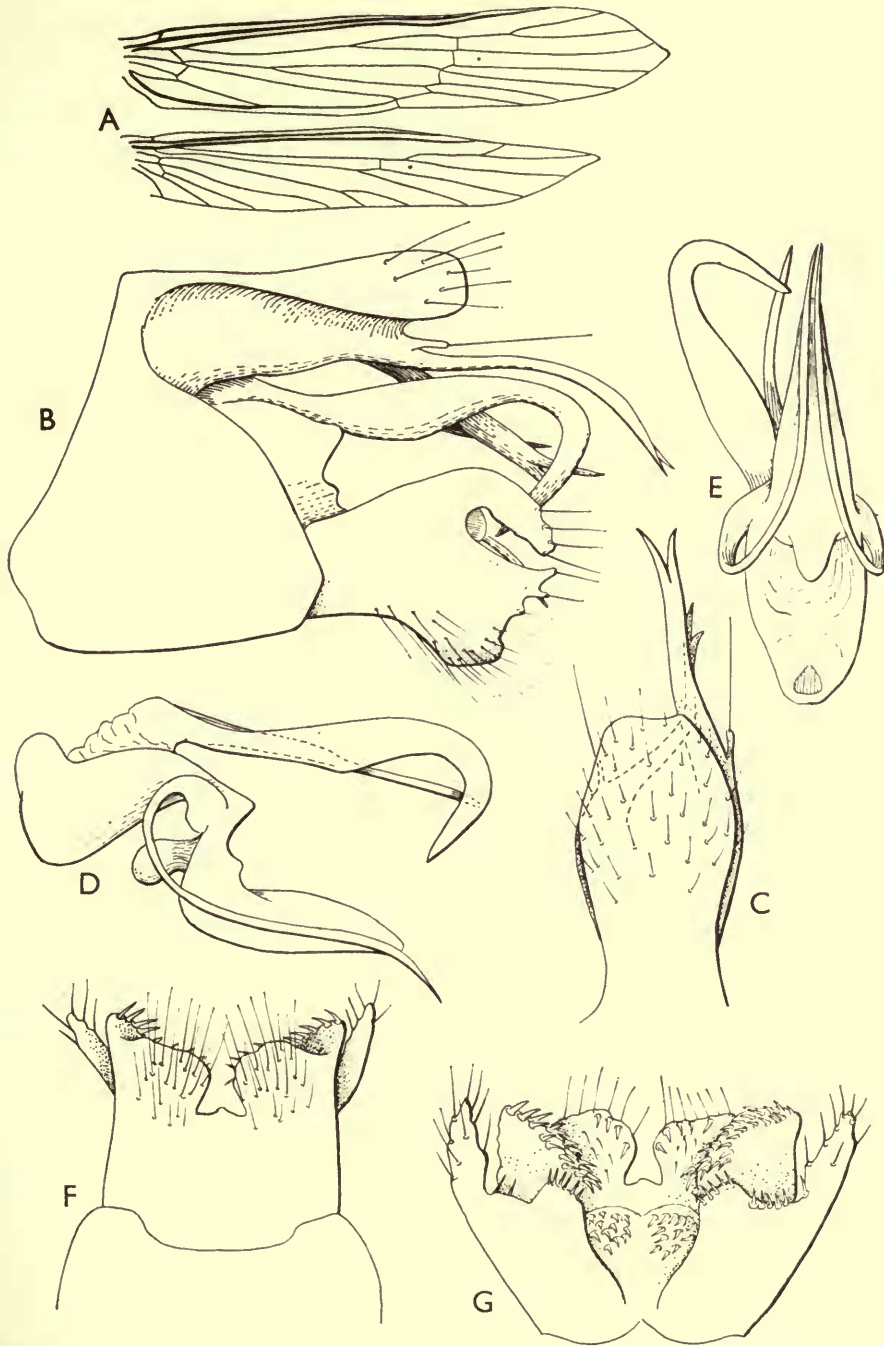


FIG. 48. *Leptocerus cheesmanae* sp. n. ♂. A, wings, B-G, genitalia; B, lateral; C, tenth segment, dorsal; D, aedeagus and parameres, lateral; E, the same, ventral; F, claspers, ventral; G, the same, dorsal, more spread out.

species which have been placed in the genus *Oecetis*. Ross (1944) has placed *Oecetodes* Ulmer amongst the synonyms of *Oecetis*, without any comment on the differences in venation of the hind wing. I did consider resurrecting *Oecetodes*, to contain all the species of *Oecetis* in which R_5 was located beyond the fork of M in the hind wing, but after a lengthy examination of the venation of as many of these species as possible, it became evident that they were not by any means a homogeneous group and I was unable to find any other venational character to support the use of the position of R_5 in the hind wing as a generic character, or to find satisfactory characters to split this group of species still further. One or two species were somewhat intermediate, R_5 joining M at the fork. I therefore propose to leave all these species in the genus *Oecetis* and hope that some day someone will make a comprehensive revision of the complex.

KEY TO THE NEW GUINEA SPECIES OF *Oecetis*, MALES

- | | | |
|---|--|----------------------------------|
| 1 | In hind wing, R_5 runs into the stem of M | 2 |
| - | In hind wing, R_5 runs into M_{1+2} | 4 |
| 2 | Fore wing with androconia | 3 |
| - | Fore wing without androconia | <i>hemerobioides</i> (McLachlan) |
| 3 | Androconia forming a dense, golden brown area in centre of wing | <i>squamosa</i> sp. n. |
| - | Androconia black, semi-erect, sparsely scattered along the veins | <i>buitenzorgensis</i> Ulmer |
| 4 | Fore wing narrow, about five times as long as wide. M_{3+4} fused with Cu_{1a} for a short distance beyond anastomosis. Tenth segment bilobed | <i>arctipennis</i> sp. n. |
| - | Fore wing three to four times as long as wide. M_{3+4} touching Cu_{1a} at a point or joined to it by a cross-vein. Tenth segment trilobed, lateral lobes sometimes indistinct | 5 |
| 5 | In fore wing, the cross-vein closing the discoidal cell is distinctly basad of anastomosis ; lateral lobes of tenth tergite forming a broad hood over aedeagus, the latter without spiniform parameres | <i>ornata</i> sp. n. |
| - | In fore wing, the cross-vein closing the discoidal cell forming a more or less continuous line with the other veins of the anastomosis. Lateral lobes of tenth tergite narrower, often inconspicuous. Aedeagus with one to three spiniform parameres | 6 |
| 6 | Clasper in side view triangular, with a basal branch | <i>mambia</i> sp. n. |
| - | Clasper in side view long and slender, with or without a basal branch | 7 |
| 7 | Clasper with a short, upwardly directed projection on upper basal margin | 8 |
| - | Clasper without such projection | 9 |
| 8 | Tenth tergite less than half the length of the clasper | <i>acuminata</i> sp. n. |
| - | Tenth tergite nearly as long as clasper | <i>longiterga</i> sp. n. |
| 9 | Claspers each with a rounded lobe on inner margin at base | <i>marginata</i> sp. n. |
| - | A broad inner plate on left clasper and a strong hook on right | <i>asymmetrica</i> sp. n. |

Oecetis hemerobioides (McLachlan)

DUTCH NEW GUINEA : Cyclops Mts., Sabron, 930 ft., v-vi. 1936, 1 ♂.
Previously recorded from Celebes, Sumba and Malaya.

Oecetis squamosa sp. n.

(Text-fig. 49)

PAPUA : Kokoda, 1,200 ft., viii. 1933, 1 ♂.

The unique male was in rather poor condition. General colour tawny. Spurs 0.?.2, mid legs missing. Wings sparsely clothed with tawny pubescence, most of the centre of the wing also

bearing small, reddish brown androconia, extending from R_1 to Cu_1 and from the origin of R_s to the apex of the discoidal cell and to about half-way between the anastomosis and wing tip in cells R_4 and M_{1+2} .

♂ GENITALIA. Ninth segment short, centre of dorsal margin scarcely produced. Cerci short, rounded apically, not fused with tenth segment, which is about twice as long as cerci, transparent, tapering to a narrow apex armed with a few short setae. Aedeagus short and stout, its lower

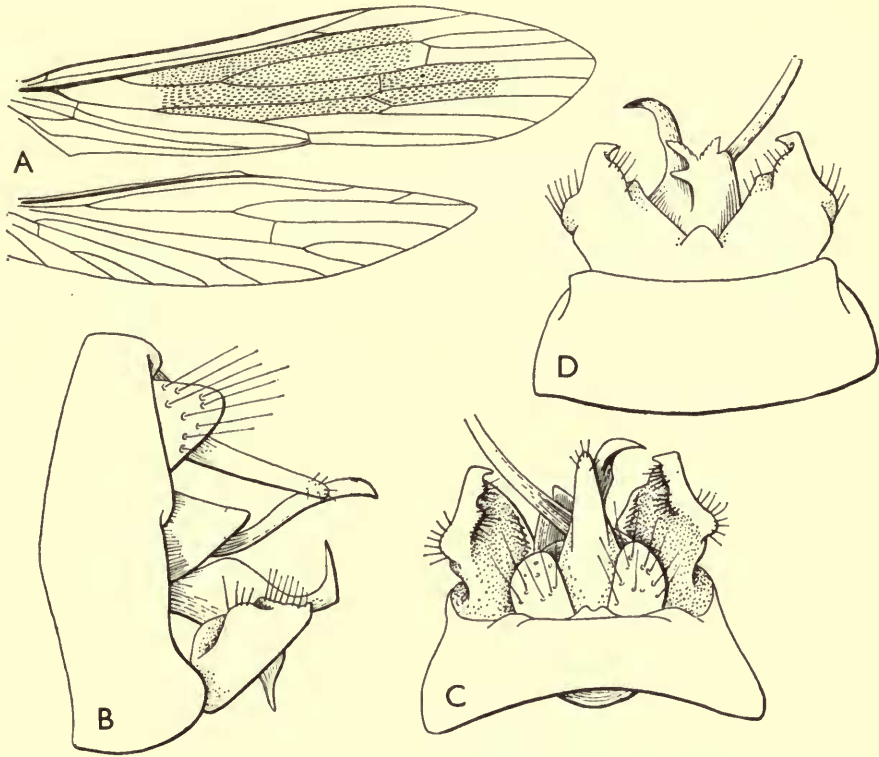


FIG. 49. *Oecetis squamosa* sp. n. ♂. A, wings; B, genitalia, lateral; C, dorsal; D, ventral.

apical margin produced in an asymmetrical trough, the left-hand margin of which is extended upwards in a recurved hook. Projecting from the aedeagus is a single, curved, spiniform paramere, its apex broken in the type. Clasper short and stout, inner and outer upper margins elevated in ridges, apex terminating in an incurved hook. From beneath, the claspers are broad and fused basally.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species resembles *O. unicolor* McLachlan (New Zealand) and *O. pechana* Mosely (Australia) in the presence of scales or androconia on the membrane of the fore wing of the male. In *O. squamosa* they are more extensive than in either of the other two species. It is a smaller insect and the male genitalia, although of the same pattern, differ considerably in detail, particularly in the claspers.

Oecetis buitenzorgensis Ulmer

PAPUA: Kokoda, 1,200 ft., vi, vii. 1933, 2 ♂.
Previously recorded from Java.

Oecetis arctipennis sp. n.

(Text-fig. 50)

PAPUA: Kokoda, 1,200 ft., ix, 1933, 1 ♂.

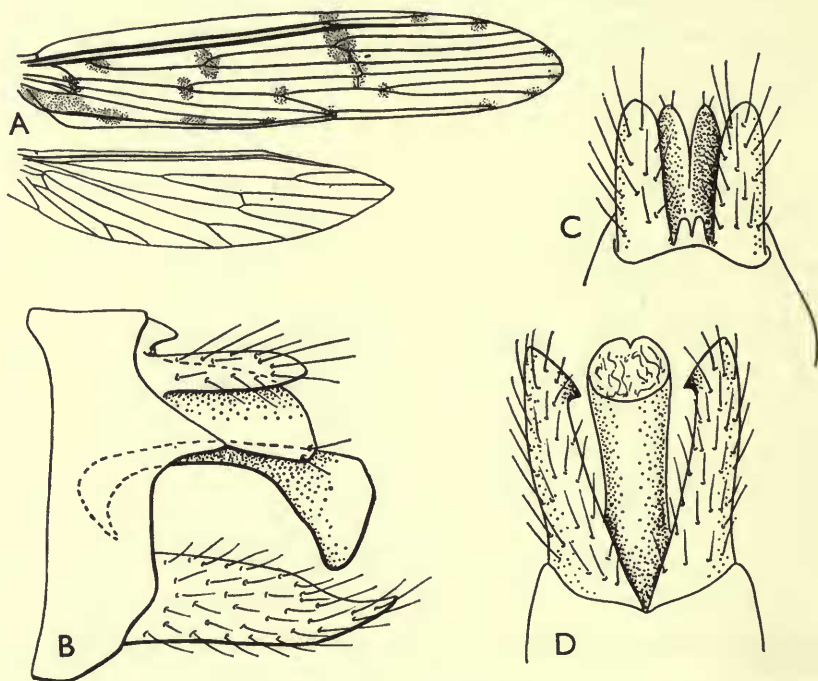


FIG. 50. *Oecetis arctipennis* sp. n. ♂. A, wings; B, genitalia, lateral; C, ninth and tenth segments, dorsal; D, claspers and aedeagus, ventral.

Head and thorax yellowish brown, darker above, with pale fuscous pubescence. Antennae pale, not annulate. Palpi with pale fuscous pubescence, basal segment of maxillary palpus shorter than second. Legs pale, spurs 0.2.2. Wings long and narrow, anterior lightly clothed with golden pubescence, the membrane marked with brownish as in Text-fig. 50A. Fore wing with apical cells long and narrow, M_{3+4} separating from Cu_{1a} beyond the anastomosis. In the hind wing, R_s joins M_{1+2} beyond the fork of M . Anterior branch of $2A$ fused with $1A$ for most of its length, separating again to give a short fork.

♂ **GENITALIA.** Ninth tergite with apical margin slightly convex, side-pieces acute and triangular. Tenth segment forming a roof over aedeagus, the sides sloping downwards, its apex excised to give two rounded lobes, each of which carries one or two setae. Cercus about as long as tenth segment, stout and digitate. Aedeagus in side view with a dorso-ventrally compressed stem, the

apex dilated downwards. Clasper a little longer than aedeagus, tapering gently to a slightly upturned apex in side view, parallel-sided with obliquely truncate apices in ventral view, the inner apical angle produced in a short, stout tooth.

Length of fore wing, ♂, 8 mm.

♂ HOLOTYPE pinned, one pair of wings mounted between cover-glasses, abdomen cleared and in glycerine. Although R_5 in the hind wing runs into M_{1+2} , and the apical cellules are rather long and narrow, as in most of the other Papuan *Oecetis* in this group, this species may be distinguished by M_{3+4} in the fore wing being fused for a short distance with Cu_{1a} and by the differently formed male genitalia, especially the aedeagus, which has no internal parameres and by the shorter, non-caliper-like claspers. The partial fusion of $1A$ and $2A$ in the hind wing, although present on both sides, may be an aberration.

Oecetis ornata sp. n.

(Text-fig. 51)

DUTCH NEW GUINEA: Humboldt Bay, ix-x. 1893, W. Doherty, ex McLachlan Coll., 1 ♂.

General colour pale brownish. Spurs 0.2.2. Anterior wing densely ciliate on margins, hairs long and golden. Membrane brown basally, hyaline apically, the brownish part with irregular hyaline markings, the apical part with brownish markings along the veins and cross-veins. Hind wing smoky hyaline, densely ciliate. In the fore wing, cell R_2 overlaps the apical third of the discoidal cell; thyridial cell unusually short, its base about level with base of discoidal cell. In hind wing, R_s forks at about one-third from base, R_5 falling on M_{1+2} well beyond fork of M .

♂ GENITALIA. Ninth segment with dorsal apical margin not produced, side-pieces stout and triangular. Cerci short and clavate, heavily fringed with hairs. Tenth segment trilobed, the median lobe digitate, extending beyond the cerci. Lateral lobes at a lower level than the median, triangular at apices, together forming an excised hood above the aedeagus, slightly shorter than the median lobe. Aedeagus short and stout, apex rounded dorsally and with a median ventral excision. There is a short, transverse ridge on the lower surface towards the base. Clasper short and stout, in side view with a rounded elevation on the dorsal inner margin about midway and with the upper apical angle produced upwards in a short, blunt finger. From beneath, the claspers are fused basally, with a narrow, median excision, apices slightly incurved, inner surfaces concave and armed with stout setae.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species, although sharing with the following species the character of R_5 beyond the fork of M in the hind wing and the rather long apical cells, differs from them in the noticeable overlap of cell R_2 over the discoidal cell, the short thyridial cell and pattern of the fore wing and in the form of the male genitalia.

Oecetis mambia sp. n.

(Text-fig. 52)

PAPUA: Kokoda, 1,200 ft., v, vii, viii, x. 1933, 3 ♂, 6 ♀.

Spurs 0.2.2. General colour brownish fulvous. Fore wing membrane pale fulvous, veins a little darker, with two rows of rather long, dense hairs on both surfaces. Costal and apical margins

with a very dense fringe of brownish hairs. A tuft of black hairs about midway along Cu_2 and a less conspicuous one on the stem of M . Hind wing smoky hyaline, with fuscous veins, also densely fringed, margins from apex of Sc to anal angle very densely fringed. In hind wing, R_s forks at about one-third from base, fork R_2 as long as its footstalk.

♂ GENITALIA. Ninth segment short, dorsal apical margin shallowly excised. Tenth segment deeply trilobed, median lobe longer and more sclerotized than lateral lobes, digitate, somewhat

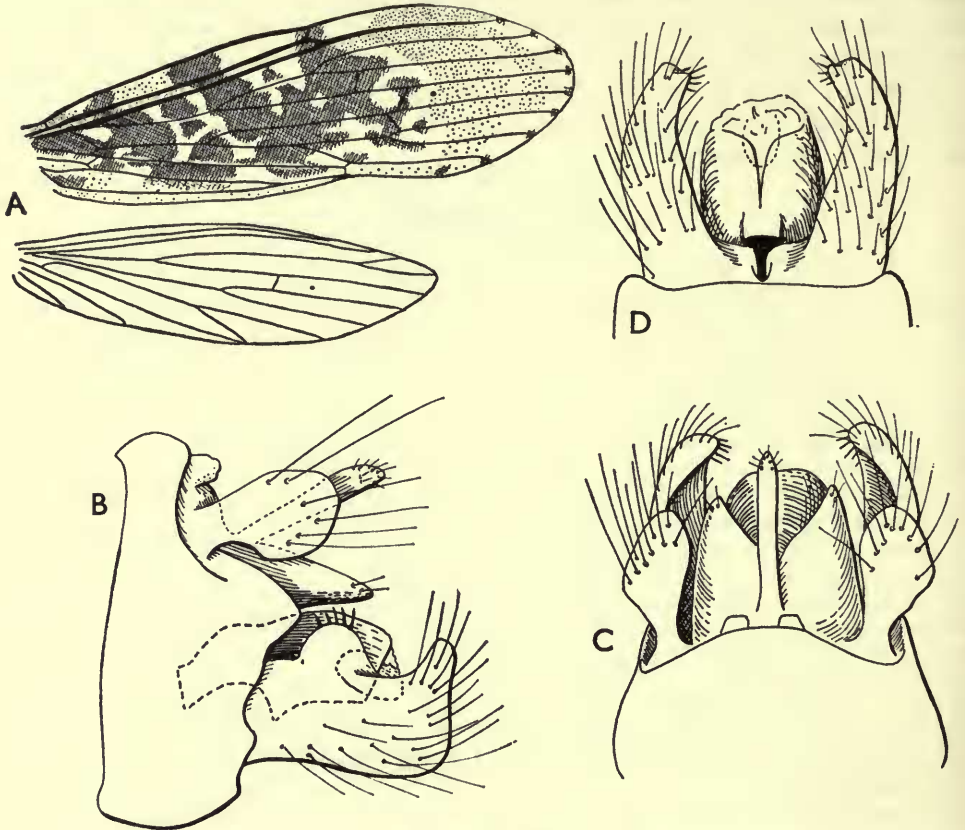


FIG. 51. *Oecetis ornata* sp. n. ♂. A, wings; B, genitalia, lateral; C, dorsal; D, claspers and aedeagus, ventral.

lanceolate at apex in dorsal view, slightly downcurved in side view. Lateral lobes divergent, transparent, each with a single bristle near apex. Cerci short and broad. Aedeagus stout, lower margin with an asymmetric apical hook, and enclosed in the membrane is a single, curved spine. Clasper narrow at base in side view, upper margin elevated in a short, curved process at base, then gradually tapered to a pointed, incurved apex.

♀ GENITALIA. Eighth sternite produced in a large, pentagonal subgenital plate, angles rounded, its base formed by a furrow, which partly differentiates it from the sternite. Ninth tergite large and deep, triangularly produced in side view. Lateral gonapophyses with upper margin much humped. Tenth segment with rounded lateral lobes enclosing the anal tube.

Length of fore wing, ♂, 9 mm., ♀, 8 mm.

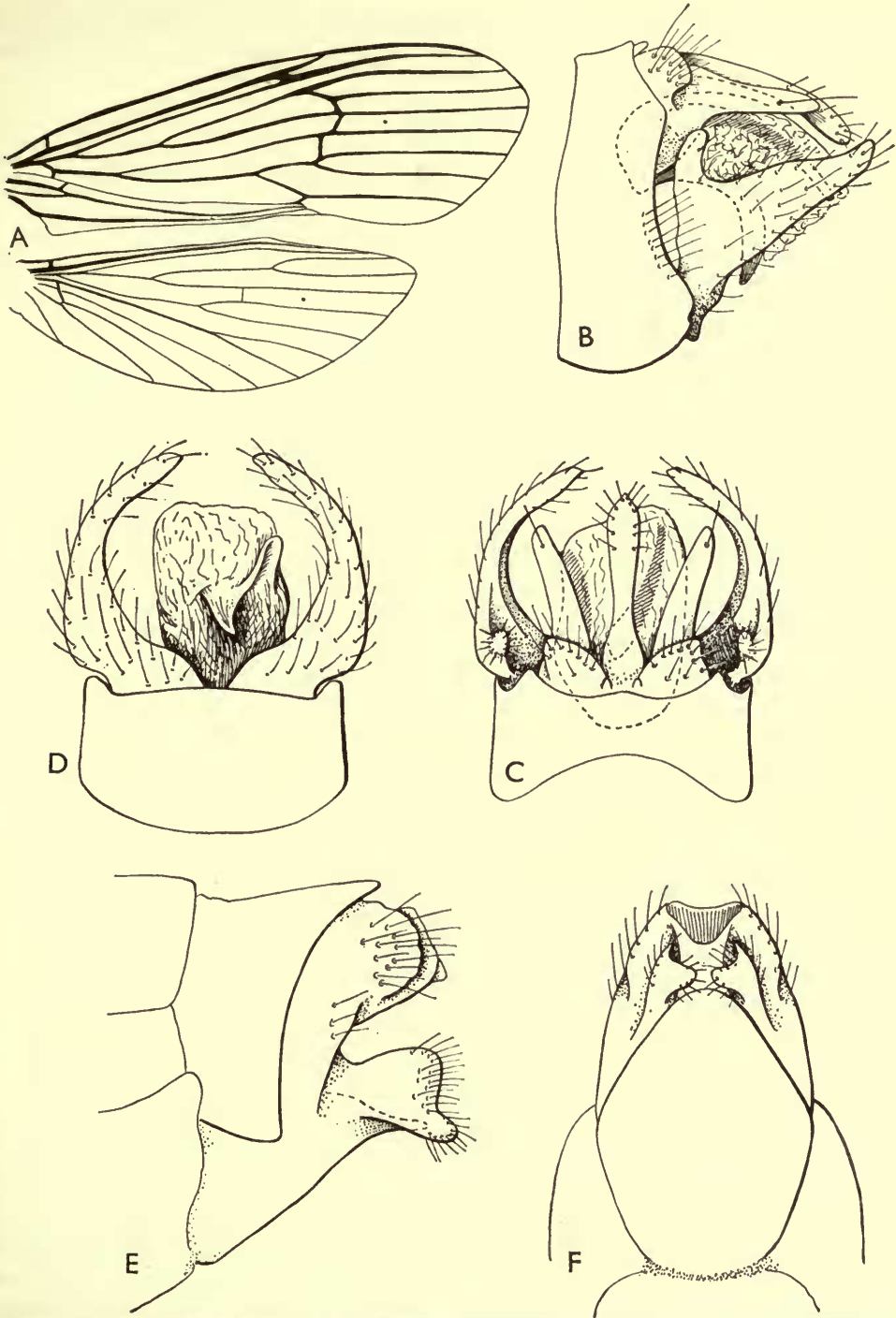


FIG. 52. *Oecetis mambia* sp. n. A, ♂, wings; B, ♂ genitalia, lateral; C, the same, dorsal; D, ♂, claspers and aedeagus, ventral; E, ♀ genitalia, lateral; F, the same, ventral.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with apex of abdomen in glycerine. This species differs from *O. marginata* sp. n. and *O. asym-*

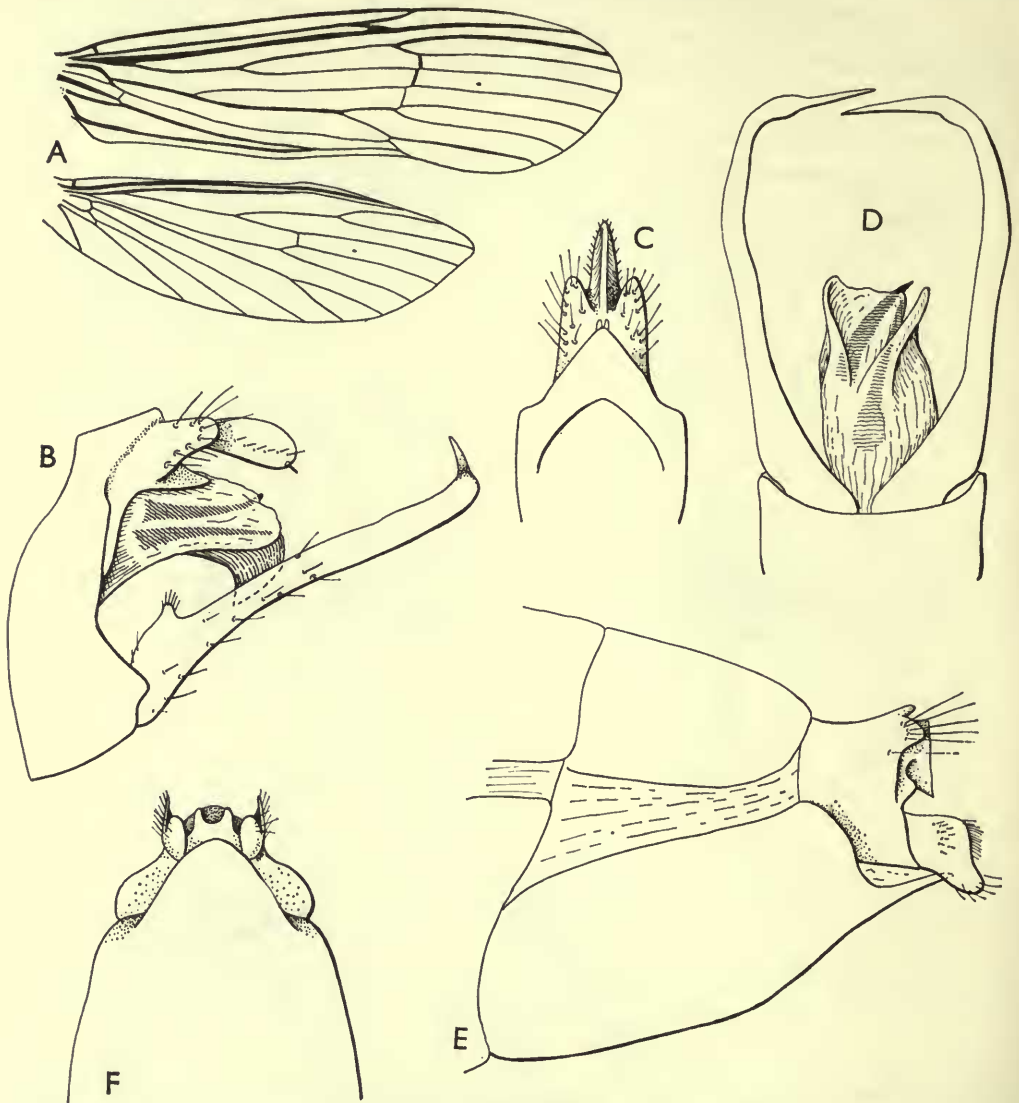


FIG. 53. *Oecetis acuminata* sp. n. A, ♂, wings; B, ♂ genitalia, lateral; C, ♂, ninth and tenth tergites, dorsal; D, claspers and aedeagus, ventral; E, ♀ genitalia, lateral; F, the same, ventral.

metrica sp. n. in the absence of the marginal bands of scales in the ♂ wings, the stouter claspers and stronger lateral lobes of the tenth segment in the male and in the female genitalia. The name "Mambia" is that of one of the Papuan "boys" employed by Miss Cheesman at Kokoda.

Oecetis acuminata sp. n.

(Text-fig. 53)

PAPUA: Kokoda, 1,200 ft., v, vi, viii-x. 1933, 2 ♂, 4 ♀.

Spurs 0.2.2. General colour dark fulvous. Antennae only faintly annulated. Fore wing with margins neither scaly nor unusually densely fringed. Cross-veins of anastomosis not thickened. In hind wing, fork R_2 about as long as its footstalk. The R_5 "cross-vein" falling on the upper branch of M .

♂ GENITALIA. Ninth segment short, dorsal margin triangularly produced at its centre. Tenth segment trilobed, median lobe elongate, laterally compressed, in side view clavate, projecting well beyond cerci. Lateral lobes short, thin and triangular, at a lower level than the median lobe, in dorsal view obscured by the cerci. The latter are bluntly triangular. Aedeagus stout, asymmetric, enclosing two spiniform parameres. Clasper very long and slender, its apical forth abruptly inturned and acuminate. At the base there is a small process on the upper margin.

♀ GENITALIA. Eighth sternite very large, its apex parabolically produced. Ninth tergite with its apical margin produced in a rounded lobe on each side. Lateral gonapophyses of the normal type. Anal tube short and deep, projecting a little beyond the ninth tergite.

Length of fore wing, ♂, 7.5 mm., ♀, 7 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine, paratypes pinned. In the slender claspers, the male shows some relationship with *O. marginata* sp. n. and *O. asymmetrica* sp. n., but it lacks the marginal scales of the wings. The large eighth sternite of the female is distinctive.

Oecetis longiterga sp. n.

(Text-fig. 54)

DUTCH NEW GUINEA: Lake Sentani, Iffar, viii. 1936, 1 ♂.

The unique male is somewhat damaged. Head and thorax tawny yellow, only bases of antennae present. Maxillary palpus with basal segment shorter than second. Legs mostly missing, spurs 0.2.?. Wings tawny yellow, anterior fairly densely fringed along costal margin, anastomosis fuscous.

♂ GENITALIA. Ninth tergite narrowed dorsally. Tenth tergite with a slender, digitate median lobe, slightly downcurved at its apex, nearly twice as long as the cerci. On either side of the median lobe is a slender, transparent process, possibly the lateral lobe of the tenth tergite. Cercus narrow, foliate, acute at apex. Aedeagus short and stout, enclosing two curved, spiniform parameres. Its apex is asymmetric, the left side being membranous, the right produced in a blunt, curved plate. Claspers fused basally, produced in long, slender, inwardly and upwardly curved, acute apices. Near the base, the dorsal margin is produced upwards in a small, setose hump.

Length of fore wing, ♂, 8.5 mm.

♂ HOLOTYPE pinned, one pair of wings between cover-glasses, abdomen in glycerine. This species is closely related to *O. acuminata* sp. n., the male genitalia following the

same pattern but differing in detail. The median lobe of the tenth tergite and the cerci are both relatively much longer and narrower. The slender, transparent lateral lobes apparently replace the short, triangular lobes of *acuminata*. The clasper is more sinuous in side view and gently incurved (not angled) in ventral view. The

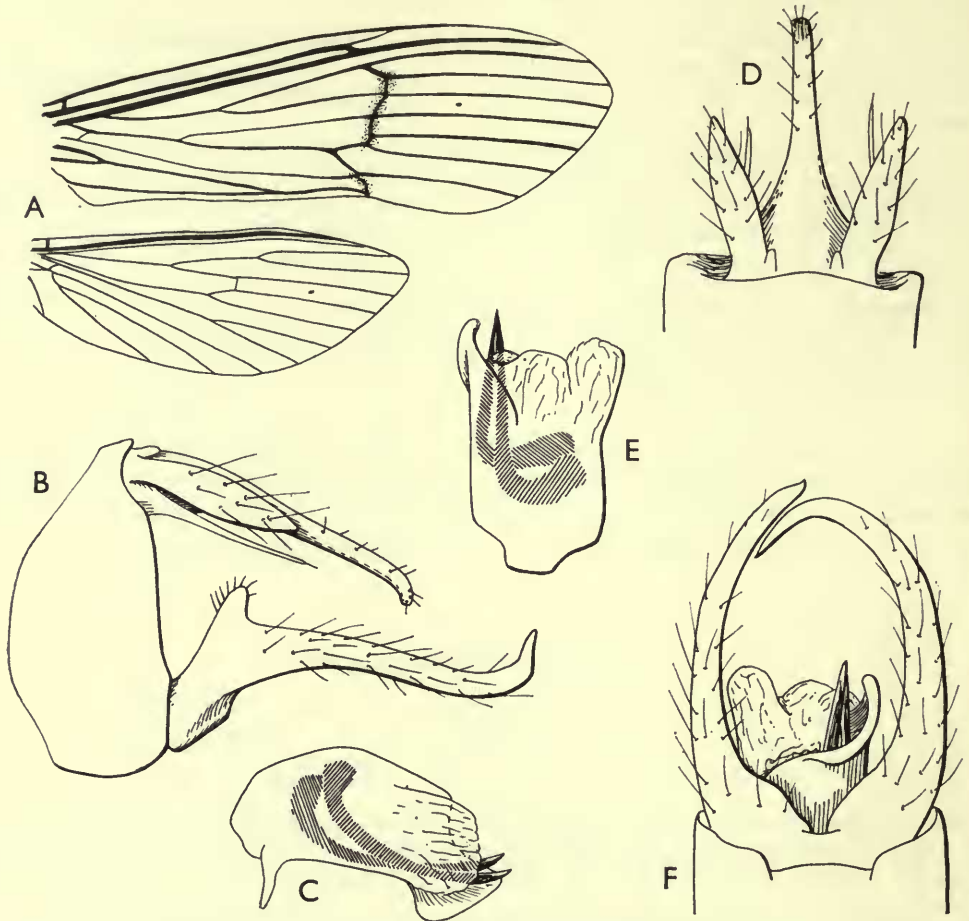


FIG. 54. *Oecetis longiterga* sp. n. ♂. A, wings; B, genitalia, lateral; C, aedeagus, lateral; D, ninth and tenth tergites, dorsal; E, aedeagus, dorsal; F, claspers and aedeagus, ventral.

venation of the fore wing is similar to that of *acuminata*, but the apical part of the wing is somewhat broader in relation to its length. The hind wing is rather broader and fork R_2 is longer in relation to its footstalk; Cu_{1a} forks only slightly beyond the level of the fork of M . There is a fragmentary second specimen from the same locality, consisting of head, thorax and one fore wing, which may belong here.

Oecetis marginata sp. n.

(Text-figs. 55-56)

PAPUA: Kokoda, 1,200 ft., iv, vi-x. 1933, II ♂, ? 9 ♀.

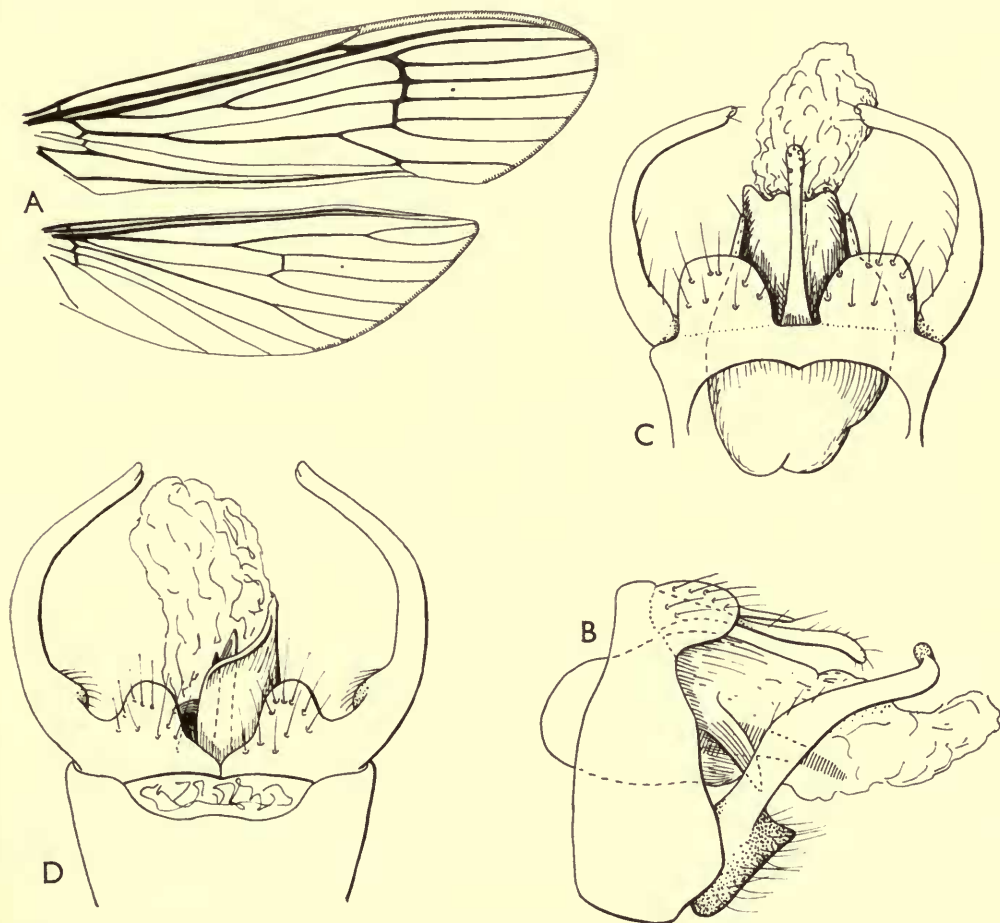
♂. Spurs o. 2. 2. General colour fulvous. Antennae luteous, faintly annulated with brownish; basal and third segments moderately long but less so than in *Oecetodella* and without a long

FIG. 55. *Oecetis marginata* sp. n. ♂. A, wings; B, genitalia, lateral; C, dorsal; D, claspers and aedeagus, ventral.

pencil of hairs. Wings moderately pubescent, the hairs in the apical third of the wing denser on the veins and forming two divergent rows. A small tuft of black hairs about midway along Cu_2 in fore wing. In fore wing, the veins of the anastomosis are thickened and fuscous. Apical margins of both wings without obvious fringe. In the male, under low magnification, these margins look soiled, as though with mud. Close examination reveals a narrow border of minute, dense scales, in the fore wing extending from about one-fourth from the base of the costa round

to the arculus, and in the hind wing from the apex to about the vein Cu_2 . Basad from this vein is a dense, silky fringe, interspersed with scales. In the fore wing, the costal margin is thin and folded over to make a narrow groove. In the hind wing, R_5 fuses with M_{1+2} distad of the median fork.

♂ GENITALIA. Ninth segment short, narrowed above. Cerci forming a pair of flattened, subquadrate plates, fused to the margin of the ninth and with a quadrate excision between them. Tenth segment consisting of a slender median process, slightly sinuous from the side, with a pair of very transparent fingers (about half as long as the median process), one on each side, terminating in a seta. Aedeagus somewhat globular, rather obscured by everted membrane, and enclosing three flattened, spiniform parameres, of unequal length, the shortest curved

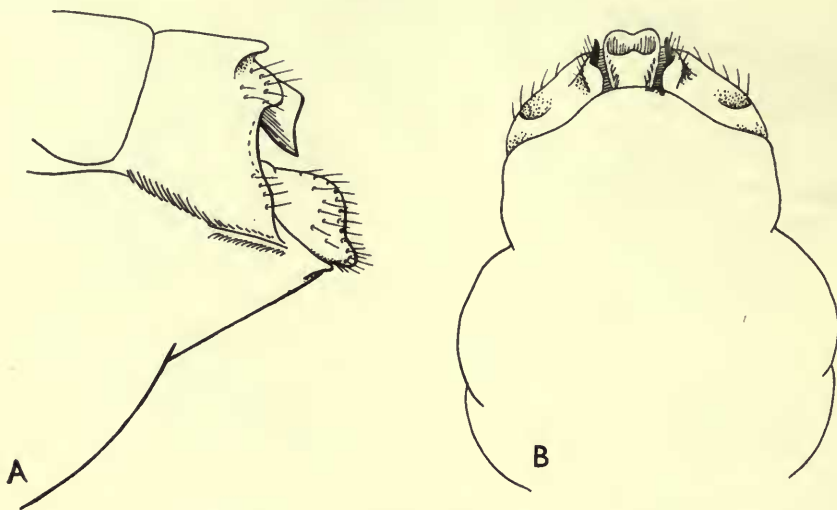


FIG. 56. *Oecetis marginata* sp. n. ♀ Genitalia. A, lateral; B, ventral.

downwards. Claspers long, slender, sinuous and incurved, each with a flattened basal lobe and a smaller lobe on the inner margin a little beyond the basal lobe.

Length of fore wing, ♂, 10 mm.

♂ HOLOTYPE pinned, one paratype mounted as microscope preparations, remainder pinned. In venation and structure of genitalia, this species is related to *O. koyana* Kimmins (Sarawak). It differs in the short, plate-like cerci and different tenth segment and more slender and incurved claspers. It also differs in the dense, minute scales bordering the male wings.

Nine females are presumed to belong to this species on the evidence of similarity of hind wing venation. They are rather smaller in wing-spread, slightly darker in colour and of course do not have the wings margined with minute scales.

♀ GENITALIA. Eighth sternite produced in a large subgenital plate, its apical margin sinuously rounded. Ninth tergite produced at its centre in a small, blunt finger, on either side of which is a small, triangular, hairy lobe. Lateral gonapophyses with a sinuous upper margin, tapering to a narrow, rounded apex. Tenth segment forming a short anal tube, its lower apical margin produced, upper excised.

Length of fore wing, ♀, 7–8 mm.

Oecetis asymmetrica sp. n.

(Text-fig. 57)

PAPUA: Kokoda, 1,200 ft., v-vii, ix-x. 1933, 12 ♂, ? 1 ♀.

♂. Spurs 0.2.2. General colour brownish fulvous. Antennae faintly annulated with fuscous. Wings rather less densely pubescent than in *O. marginata* sp. n., but with a similar black tuft on Cu_2 in the fore wing. The margins also bear similar minute scales, but in the fore wing the

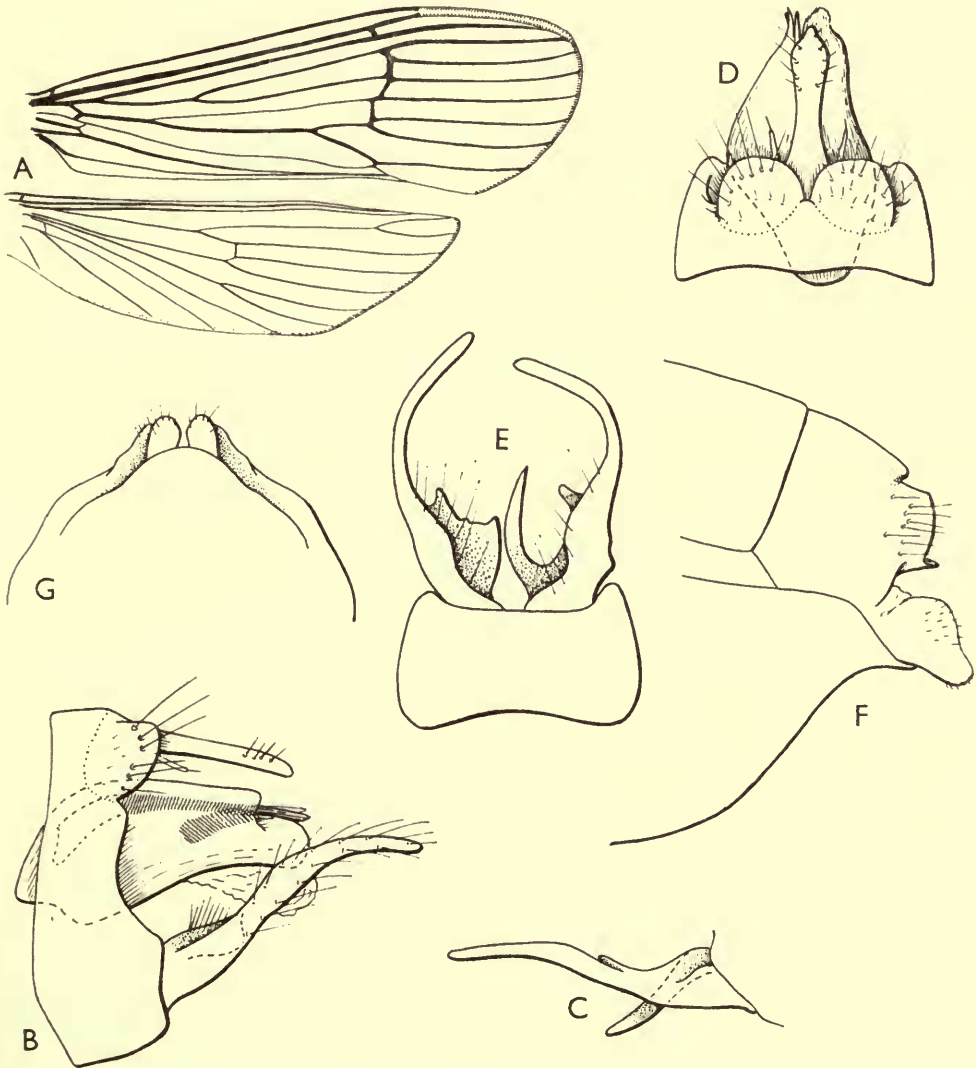


FIG. 57. *Oecetis asymmetrica* sp. n. A, ♂, wings; B, ♂, genitalia, lateral; C, ♂, right clasper, lateral; D, ♂, ninth and tenth tergites, dorsal; E, ♂, claspers, ventral; F, ♀, genitalia, lateral; G, the same, ventral.

scaly area is less extensive, commencing beyond the anastomosis, which is thickened. Apex of fore wing less pointed. Hind wing less pointed, the dense silky fringe from Cu_1 to the base of the wing with a greenish metallic sheen in certain lights. Apical fork R_2 much shorter than its footstalk.

♂ GENITALIA. Following the same general pattern as *O. marginata*. The cerci are less prominent, broader than long. Median process of the tenth segment stouter, straight in side view, dilated slightly before apex in dorsal view. Transparent fingers obscure. Aedeagus stout, tapering towards apex, asymmetric and enclosing two spiniform, curved parameres. Claspers long and slender from the side, incurved from beneath, with asymmetric lobes internally at base. The left clasper has a plate-like lobe extending over the basal third, its inner margin excised to make two blunt processes. The lobe of the right clasper is much more deeply excised, so that the basal process forms a long, curved spine, widely separated from the apical process and visible as a tailwardly directed process in side view.

Length of fore wing, ♂, 8 mm.

♂ HOLOTYPE mounted as microscope preparations, paratypes pinned. This species is a close relative of *O. marginata* and the differences are set out in the foregoing description.

A single female is referred, with some doubt, to this species on the similarity of the venation of the hind wing.

♀ GENITALIA. Eighth segment with its ventral margin more sinuous in side view. Anal tube fused with ninth segment and largely concealed. Lateral lobes of the ninth tergite more quadrate than in *O. marginata*. Lateral gonapophyses blunter at apices.

Length of fore wing, ♀, 7 mm.

Oecetis spp.

DUTCH NEW GUINEA: Cyclops Mts., Sabron, 930 ft., v. 1936, 2 ♀.

Japen Island, Mt. Eiori, 2,000 ft., ix. 1938, 1 ♀.

PAPUA: Kokoda, 1,200 ft., vi-ix. 1933, 8 ♀.

Mt. Tafa, 8,500 ft., iii. 1934, 1 ♀.

The first two specimens may possibly be the females of *O. longiterga* sp. n., but being from a different locality, it seems unwise to associate them definitely.

TRIAENODES McLachlan

KEY TO SPECIES OF *Triaenodes* FROM NEW GUINEA (MALES)

Triaenodes lorlai Navás is omitted owing to its inadequate description.

1	No spiniform branch arising from base of clasper	2
-	Spiniform branch present	4
2	Aedeagus moderately stout, with parameres	3
-	Aedeagus long, slender, spiniform, without parameres	<i>longispina</i> sp. n.
3	Costal area of fore wing with a dense, longitudinal band of broadened black hairs on under surface	<i>costalis</i> sp. n.
-	Costal area without such hairs	<i>insulana</i> Ulmer
4	Median lobe of tenth segment very short. Basal branch of clasper consisting of two slender spines. Fore wing with two longitudinal bands of black androconia on dorsal surface, in costal and radial areas	<i>nigrolineata</i> sp. n.
-	Median lobe of tenth segment long. Basal spiniform branch single. Fore wing without bands of black androconia	5

- | | | |
|---|---|------------------------|
| 5 | Tenth segment not produced in spines | 6 |
| - | Tenth segment produced in spines | 7 |
| 6 | Tenth segment about as long as median lobe and cerci. Basal branch of clasper stoutly spiniform | <i>tafana</i> sp. n. |
| - | Tenth segment much shorter than median lobe or cerci. Basal branch of clasper slender | <i>mondoana</i> sp. n. |

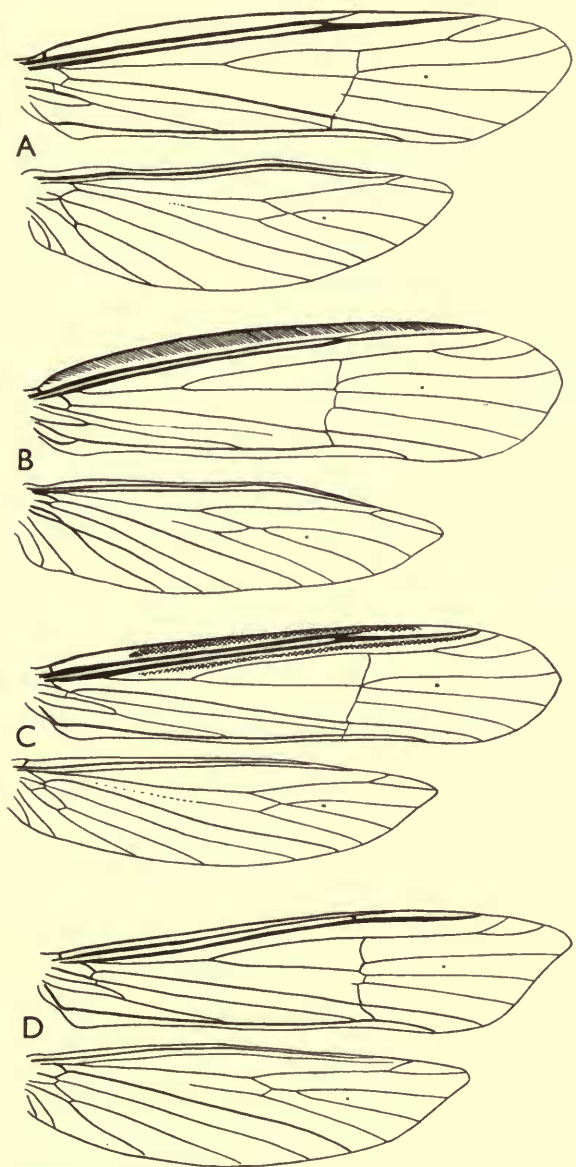


FIG. 58. Wings of *Triaenodes* spp. n. ♂. A, *longispina* ; B, *costalis* ; C, *nigrolineata* ; D, *tafana*.

- 7 Median lobe of tenth segment terminating in a downwardly directed beak. Clasper with a complex, coral-like inner branch *corallina* sp. n.
 - Median lobe of tenth segment not beaked at apex. Clasper without such inner branch 8
 8 Fore wing almost entirely pale golden *aurea* sp. n.
 - Fore wing golden, with a fuscous apex *ustulata* sp. n.

Trienodes longispina sp. n.

(Text-figs. 58-59)

PAPUA: Kokoda, 1,200 ft., iv-viii. 1933, 2 ♂, 4 ♀.

General colour yellowish. Antennae luteous, strongly annulated with fuscous, the annulations becoming less distinct towards apices. Basal segment long, densely clothed with golden hairs. In a cleared male example can be seen a longitudinal flap running the length of the segment and covering a basal tuft of hairs. Maxillary palpi densely pubescent, mainly golden but fuscous at articulations. Legs yellowish, anterior tibia and tarsus brownish externally. Anterior wing with fine golden pubescence and with two distinct, and two less evident, spots of fuscous pubescence along the anal margin. In the apical area are three faint, transverse streaks of fuscous pubescence, one just basad of the anastomosis, another (more oblique) from the apex of the discoidal cell to the middle of the cell Cu_{1a} and the third from the anterior margin to R_5 . Hind wing hyaline, very sparsely pubescent.

♂ GENITALIA. Ninth segment narrowed dorsally, the apical margin produced in a transverse plate. Ventral margin much more produced and quadrate in ventral view. Tenth segment trilobed, the median lobe short, digitate, bearing two rows of short setae. Lateral lobes very long and spiniform, curving downwards. Cerci a little longer than median lobe of tenth segment, digitate. Aedeagus also very long, spiniform and curved, paralleling the spines of the tenth segment. Claspers fused basally, about twice as long as the ninth segment. Basally they are stout, tapering somewhat towards the apices. From the side, the apex is dilated and set with numerous setae, arising from elevated bases. The outer apical angle forms a strong, incurved hook and there is also a small finger-like projection above the base of the hook.

♀ GENITALIA. Eighth sternite with apical margin slightly convex, fringed with setae. Ninth and tenth tergites more or less fused, the line of fusion evident in side view as a "step" on the dorsal surface, but becoming very indefinite on the sides. The tenth segment forms a short, tapering anal tube with a truncate apex in side view. Bursa copulatrix as figured. There appears to be a membranous tube or sac at the base, much telescoped near its attachment to the bursa.

Length of fore wing, ♂, 8 mm., ♀, 7 mm.

♂ HOLOTYPE (iv. 1933) mounted as microscope preparations, ♀ allotype (vii. 1933) pinned, with abdomen cleared and in glycerine, paratypes pinned. This species differs from *T. insulana* Ulmer and *T. costalis* sp. n. in the absence of the long, hood-like production of the tenth tergite and in its long, slender, spiniform appendages.

Trienodes costalis sp. n.

(Text-figs. 58, 60)

PAPUA: Kokoda, 1,200 ft., viii. 1933, 1 ♂.

Head tawny yellow, with fulvous pubescence. Antennae pale, with fuscous annulations, basal segment long and bearing a longitudinal flap covering, at the base, a tuft of black hairs and with a tuft of golden hairs at the apex of the segment. Thorax tawny yellow, with fulvous pubescence. Legs pale fulvous. Fore wing densely clothed with fulvous pubescence and with two small fuscous spots along the posterior margin, the outer one at the arculus. The costal margin bears a dense fringe of broadened, black hairs on the under surface, directed obliquely

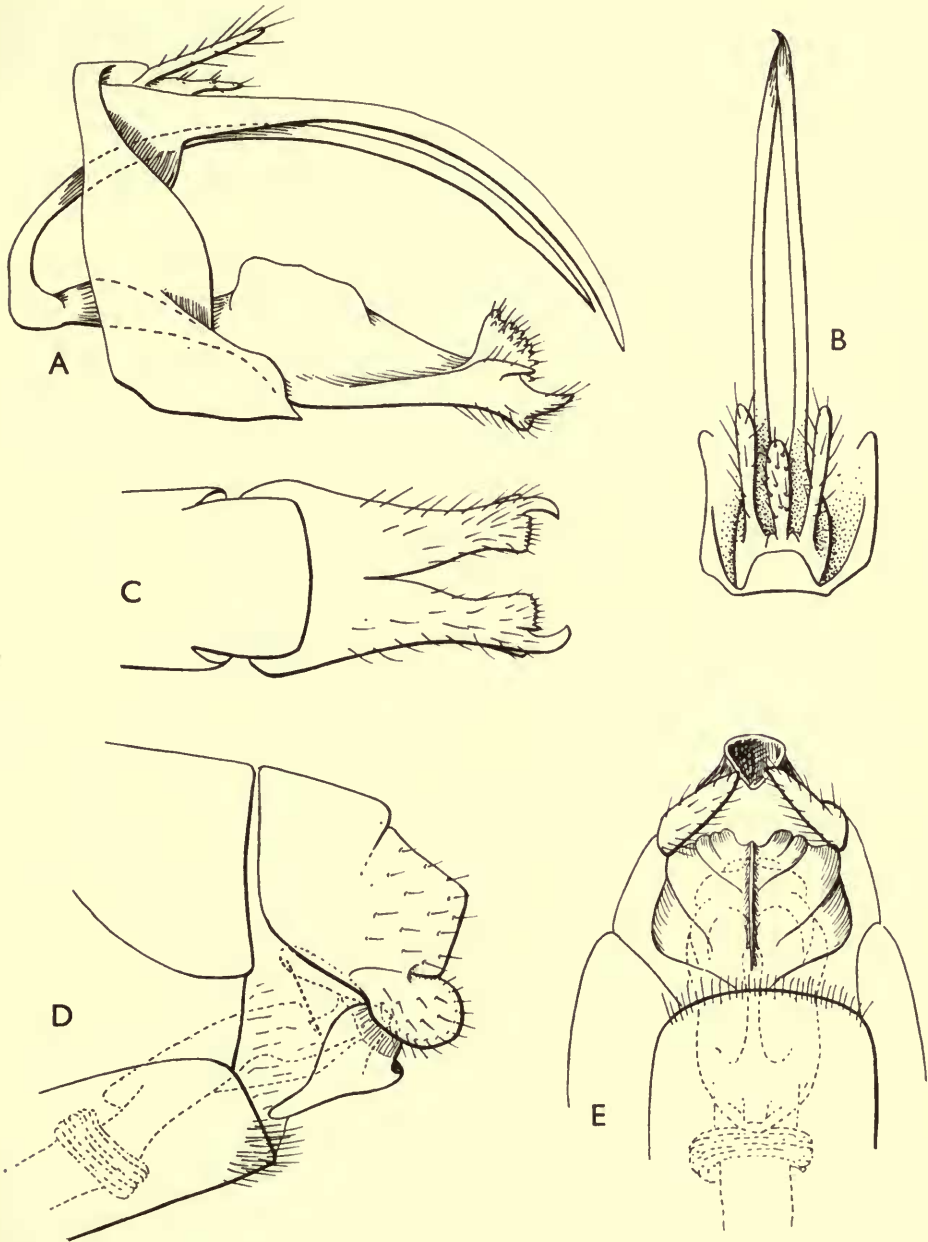


FIG. 59. *Triaenodes longispina* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth tergites, dorsal; C, ♂, ninth segment, claspers, ventral; D, ♀ lateral; E, ♀, ventral.

towards the apex of the wing and giving, in the pinned specimen, the appearance of a costal fold. Hind wing with fairly dense fuscous pubescence.

♂ GENITALIA. Ninth segment narrowed to a transverse rib dorsally, the ventral margin produced in a quadrate lobe with concave lateral margins and a shallow median excision. Tenth segment large and complex; the upper portion comprised a slender median process between

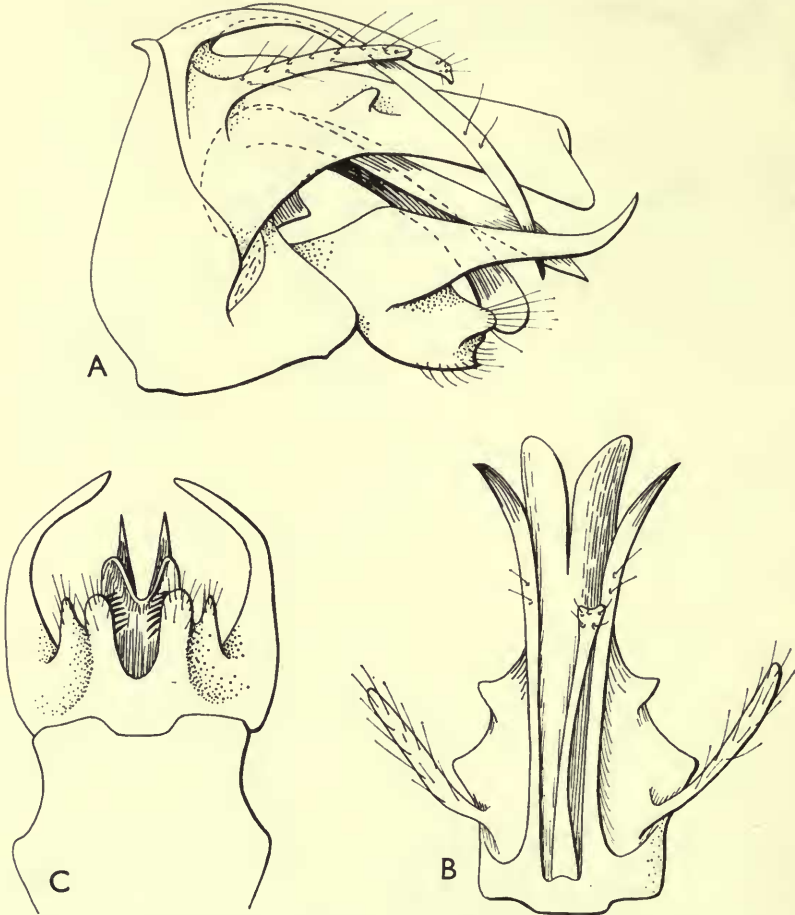


FIG. 60. *Triaenodes costalis* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

two downcurved spines, which are half as long again as the median process. The lower portion forms a long, roof-like hood over the aedeagus, broad at its base, tapering to a narrow, bifid apex, which is obliquely truncate in side view. On each side, about midway, arises a short, blunt process. Cerci (left-hand missing in type) slender, digitate and divergent. Aedeagus stout at base, with a slender stem, trough-like and with an excised apex in ventral view; two slender, blade-like parameres. Claspers with broad, fused bases and with slender, incurved, acute apices. From beneath, the basal part forms two rounded projections and the inner surface carries some much-branched processes, armed with stout setae.

Length of fore wing, ♂, 8 mm.

♂ HOLOTYPE mounted as microscope preparations. In the structure of the male genitalia, this species appears to have some affinity with *T. insulana* Ulmer, from Kei Island. There is a similar, rather long, hood-like tenth segment, the main branch of the clasper is rather long and caliper-like and there is no spiniform basal branch. There are, however, two blade-like parameres, which may be homologous with the spines rather confusingly shown in Ulmer's figure, partly in solid and partly in broken line. In detail the genitalia are adequately distinct. Ulmer makes no mention of the costal band of broadened black hairs on the under surface of the fore wing.

Trienodes nigrolineata sp. n.

(Text-figs. 58, 61)

PAPUA: Kokoda, 1,200 ft., v. 1933, 1 ♂.

Head tawny, with fulvous hairs. Antennae pale, annulated with fuscous, basal segment long, with a longitudinal flap covering traces of a basal tuft of hairs. Palpi fulvous. Thorax tawny, with golden pubescence. Legs luteous. Fore wing densely clothed with fulvous pubescence,

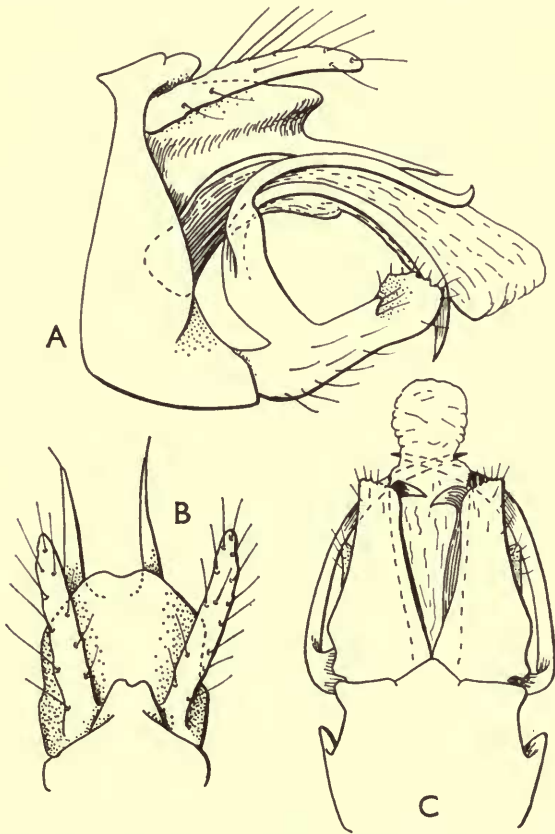


FIG. 61. *Trienodes nigrolineata* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

with scattered spots of fuscous pubescence along the posterior margin, at the anastomosis and in the apical cellules. In the costal and radial areas are two clearly-defined, jet-black streaks composed of short, broad androconia on the dorsal surface of the wing. Hind wing with sparse, fuscous pubescence.

♂ GENITALIA. Ninth segment narrowed above, but with the centre of the apical dorsal margin produced in a triangular plate with a bilobed apex. Cerci long and stout, digitate, slightly downcurved. Tenth segment forming a thickened, broad plate, covering the aedeagus, apex tapered and slightly excised. From beneath the apex arise two slender processes, apices transparent and each armed with a short seta. Aedeagus slender at base, arched downwards, apex membranous. Clasper with the main part slender from the side, apex slightly clavate and setose. The outer, upper margin is produced in a small, triangular lobe about midway. From beneath, the main part is broad at base, tapering to a truncate apex. On the upper surface towards the base is a transverse ridge, from which arises a pair of long, curved spines, the outer directed upwards and then curving caudad and inwards over the aedeagus. The inner spine is directed upward and caudad, running closely alongside the aedeagus.

Length of fore wing, ♂, 6 mm.

♂ HOLOTYPE mounted as microscope preparations. This species differs from the previously mentioned ones in the presence of spiniform, basal branches of the claspers.

Trienodes tafana sp. n.

(Text-figs. 58, 62)

PAPUA : Mt. Tafa, 8,500 ft., iii. 1934, 2 ♂.

General colour dark fulvous. Head with golden hairs. Antennae fulvous, annulated basally with gold. Basal segment long, clothed with a mixture of golden and fuscous hairs. There is a large oval flap on the dorsal surface, covering a ligulate structure. Palpi fulvous, annulated with fuscous. Thorax fuscous above, with golden pubescence, yellowish on the sides and beneath. Legs clothed with yellowish and fuscous pubescence. Fore wing with fuscous and pale golden pubescence, the latter forming marginal spots in the apical cellules and less definite markings elsewhere. There is a dark fuscous tuft about midway along the anal margin and another just beyond the arculus. Hind wing hyaline, sparsely pubescent. Apices of both wings very slightly falcate.

♂ GENITALIA. Ninth segment narrowed dorsally to a transverse band. Ninth sternite moderately produced and rounded in ventral view. Cerci moderately long, flattened dorso-ventrally, tapering apically. Tenth segment forming a hood over the aedeagus, broad at its base in dorsal view, tapering to an excised apex. From its base on the upper surface arises a slender, digitate, median process, as long as the hood. Aedeagus long, curved, its upper surface membranous and with a single, spiniform paramere beneath. Clasper in side view somewhat swollen in basal half, apical half narrower and curved upwards. From the base of the clasper arises a strong, curved, blunt spine, terminating in a single seta. From beneath, the clasper is less dilated in its basal half, and the upcurved apical part tapers to an out-turned apex.

Length of fore wing, ♂, 6.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. This species differs from *T. nigrolineata* sp. n. in the absence of the two lines of black androconia on the fore wing, the single, stout spiniform branch of the clasper and the longer median lobe of the tenth segment. Tenth segment not produced in spines.

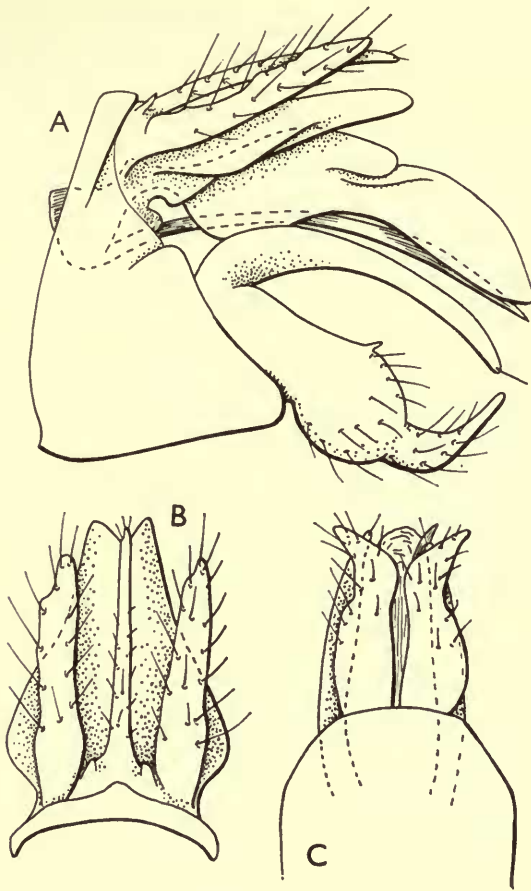


FIG. 62. *Triaenodes tafana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

***Triaenodes mondoana* sp. n.**

(Text-figs. 63, 64)

PAPUA: Mondo, 5,000 ft., I. 1934, I ♂.

General appearance much as in *T. tafana* sp. n. The insect is rather smaller, the wings narrower and the fore wing blotched with fuscous and light and dark golden pubescence. Apex of fore wing not falcate, of hind wing only slightly falcate.

♂ GENITALIA. Ninth segment narrowed above but with the apical margin convexly produced at its centre. Ventral margin produced in a short, transverse plate, the centre of whose apical margin is slightly excised. Cerci digitate, slightly divergent. Tenth segment forming a short hood with lateral margins turned down and apices slightly produced. From the base there arises an elongate, slender median process, whose apex is bifid in dorsal view. Aedeagus long, arched, the dorsal surface membranous and somewhat granulose, apparently without parameres. Claspers each with a spiniform basal branch, asymmetric in the type. Both are directed first

towards the base of the abdomen and then curve upwards and caudad alongside the aedeagus. That of the left clasper is a very weak, slender, rather short spine but that on the right is stronger and much longer, curving upwards and crossing over the dorsal surface of the aedeagus. The

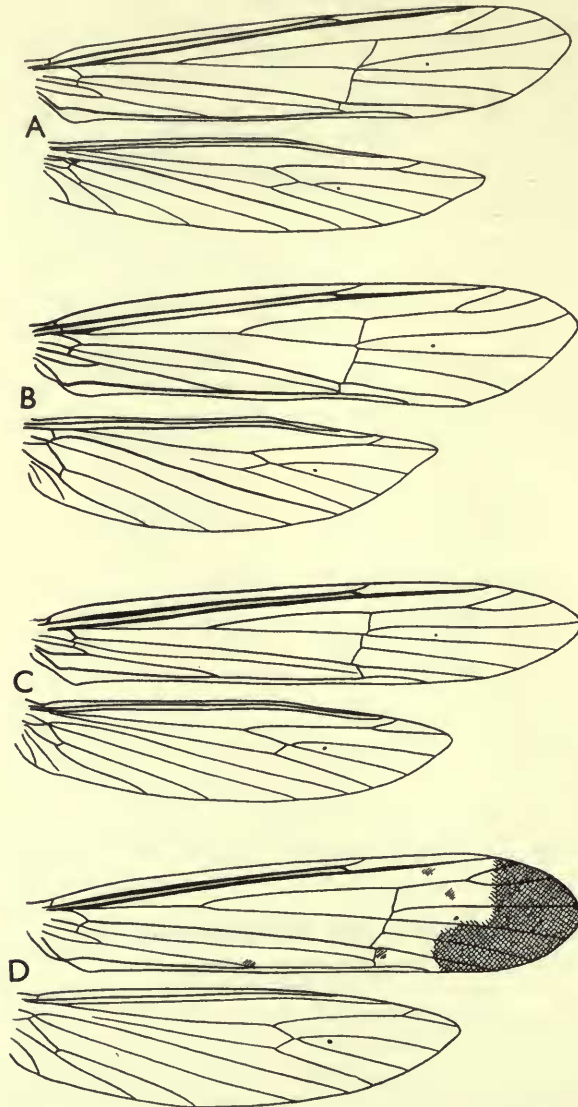


FIG. 63. Wings of *Triaenodes* spp. n. ♂. A, *mondoana*; B, *corallina*; C, *aurea*; D, *ustulata*.

main part of the clasper is about as long as the ninth segment, its width at base in side view about two-fifths of its length, tapering gently to the apex. The upper surface is irregularly serrate. From beneath, the claspers are fused basally, and in their apical two-thirds each is slightly sinuously parallel-sided, inner apical margin set with socketed teeth.

Length of fore wing, ♂, 5.5 mm.

♂ HOLOTYPE pinned, one pair of wings mounted between cover-glasses, abdomen in glycerine. This species is very similar in general appearance to the previous one but the male genitalia are entirely distinct. The fact that two such comparatively

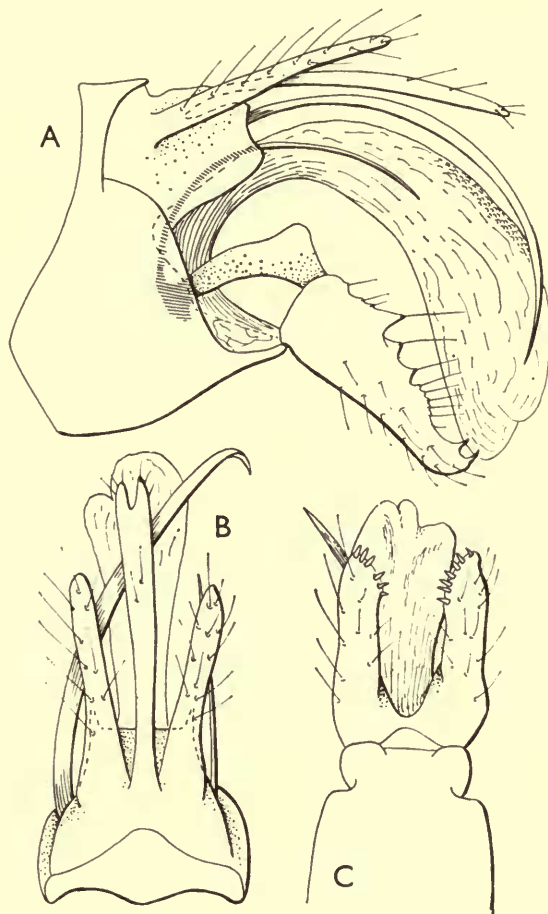


FIG. 64. *Triaenodes mondoana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

similar insects should have such different male genitalia stresses the danger of attempting to associate males and females on general appearance.

Triaenodes corallina sp. n.

(Text-figs. 63, 65)

PAPUA: Kokoda, 1,200 ft., vii, ix. 1933, 2 ♂.

General appearance and wing pattern as in *T. longispina* sp. n. Wing venation also similar, but apices of wings more acute, that of the hind wing being slightly falcate.

♂ GENITALIA. Ninth segment cut back dorsally to a narrow, transverse band. Ventral margin quadrately produced, with a wide excision in ventral view. Cerci digitate, moderately stout. Upper part of tenth segment forming a long, slender median process, lower apical margin pro-

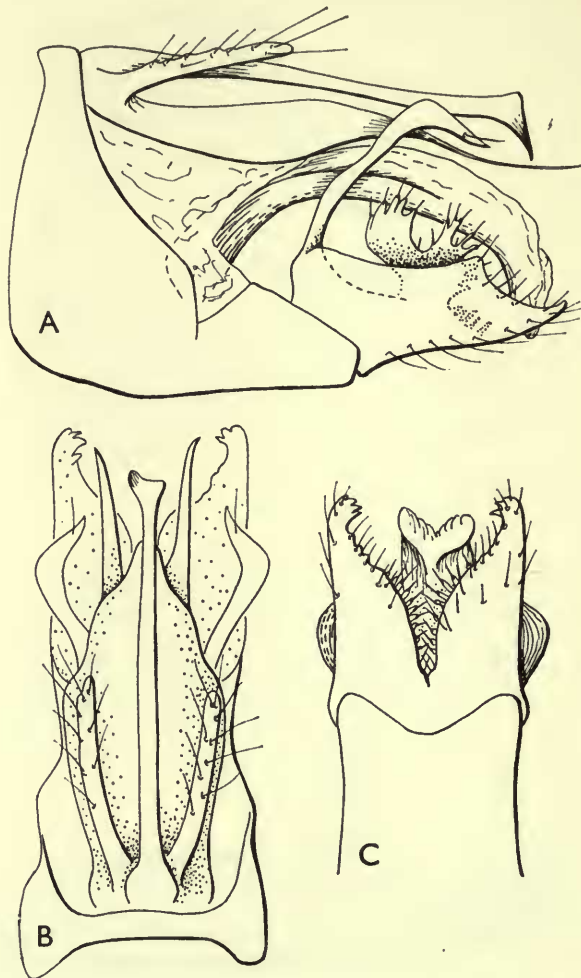


FIG. 65. *Triaenodes corallina* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

duced downwards in an acute beak. Lower part of the tenth segment forms a long hood, broad at its base, lateral margins tapering sinuously to a rounded apex. From beneath the apex extend two long, slender, semi-transparent processes, reaching slightly beyond the apex of the upper part. Aedeagus moderately long, slender at base, arching downwards. Claspers fused basally. The main part is about twice as long as deep in side view, its apex obliquely excised, the lower apical angle pointed. From the inner surface about midway arises a branched, somewhat coral-like structure, all its terminal branches armed with short setae. Spiniform basal

branch erect, its apex directed caudad. From beneath, the apex of the main part of the clasper is strongly serrate.

Length of fore wing, ♂, 8.5 mm.

♂ HOLOTYPE mounted as microscope preparations, paratype pinned. This species may be recognized by the beaked apex of the median process of the tenth segment, the rather long tenth segment with slender apical spines and by the complex, coral-like inner branch of the clasper.

Triaenodes aurea sp. n.

(Text-figs. 63, 66)

PAPUA : Mt. Tafa, 8,500 ft., iii. 1934, 1 ♂.

General appearance yellowish, with golden pubescence. Antennae luteous, with fuscous annulations. Basal segment long, densely clothed with long golden pubescence. The dorsal flap on this segment is small, barely covering the basal half. Thorax with long golden pubescence. Legs luteous. Fore wing with dense golden pubescence, a patch of fuscous pubescence half-way along anal margin and an indistinct patch of fuscous pubescence about half-way between anastomosis and apex. Hind wing with sparse golden pubescence. Wings rather narrow, apices not falcate. Discoidal cell in fore wing elongate, about as long as its footstalk.

♂ GENITALIA. Ninth segment dorsally fused with tenth. Ninth sternite produced in a quadrate lobe with sinuous apical margin. Cerci long, digitate. Tenth segment forming a broad, plate-like hood, its lateral apical angles produced in long, downcurved spines, with a U-shaped excision between them. Median lobe of tenth segment also very long, exceeding the cerci, slender and digitate, with a short, transparent process on each side about midway. Aedeagus long and arched downwards, membranous above. Claspers fused basally, each composed of a basal branch and with the main part of the clasper divided into an outer and an inner lobe. The basal branch is slender, about as long as clasper and arched beneath the aedeagus. The outer lobe is roughly triangular in side view, digitate in ventral view. The inner lobe, which is also the lower, is about twice as long as the outer. It is slightly forcipate, the inner margin with a serrate projection about midway, apex of clasper acute.

Length of fore wing, ♂, 8.5 mm.

♂ HOLOTYPE mounted as microscope preparations. This species may be recognized by the almost entirely golden fore wings and by the distinctive male genitalia.

Triaenodes ustulata sp. n.

(Text-figs. 63, 67)

PAPUA : Kokoda, 1,200 ft., v-vii. 1933, 1 ♂, 14 ♀.

Head tawny, with golden hairs. Antennae luteous, with fuscous annulations, basal segment long, clothed with golden hairs; in the male, the flap is as long as segment. Maxillary palpi with fuscous pubescence. Thorax tawny, with golden pubescence on dorsum. Legs luteous. Fore wing with dense golden pubescence on most of wing, except the apex, which is fuscous. Hind wing with sparse fuscous pubescence. In fore wing, discoidal cell is longer than its footstalk.

♂ GENITALIA. Ninth sternite produced in a transverse lobe with a truncate apex. Dorsal margin of ninth segment fused with tenth and produced in a long, tapering, sclerotized spine with a bifid apex. This is probably the more than usually sclerotized median lobe of the tenth

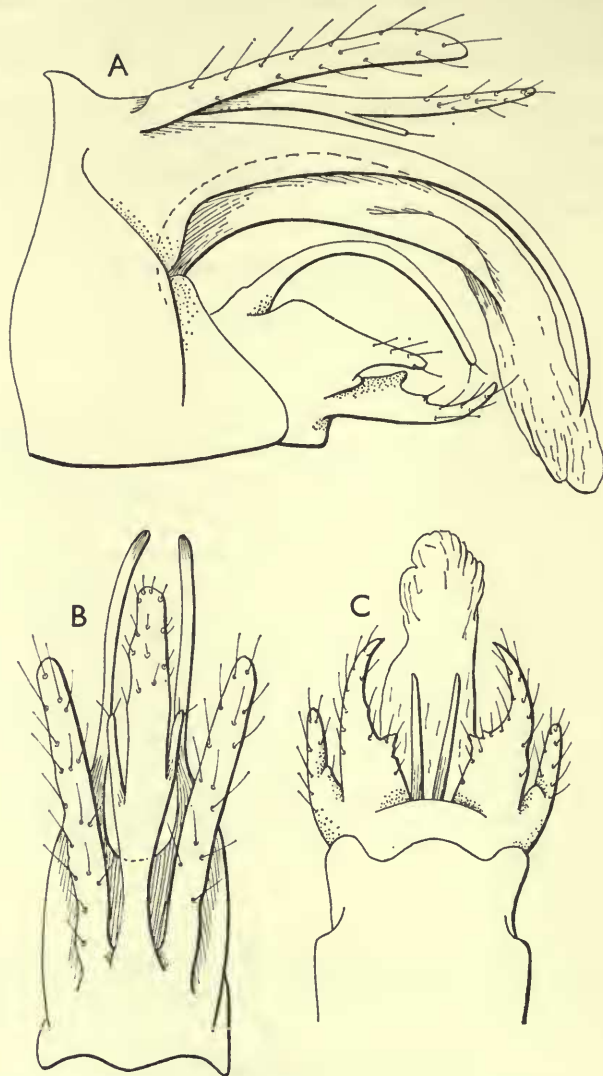


FIG. 66. *Triaenodes aurea* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth segment, claspers and aedeagus, ventral.

segment. Lateral lobes of the tenth segment also produced in long, sinuous spines. Cerci about half as long as median lobe, in side view dilated about midway, in dorsal view slender. Aedeagus short and arched, membranous above. Claspers fused basally, short, divided into an upper and a lower branch, in addition to the usual basal branch. The latter is spiniform, sickle-shaped, with a short, ventral spur about midway. Upper branch of clasper arising about midway along lower branch, somewhat clavate in side view and setose. Lower branch tapering to an acute apex in side view, broadly triangular in ventral view.

♀ GENITALIA. Eighth sternite truncate apically and fringed with setae. Ninth and tenth

tergites fused to form a hood, apex truncate in side view. Tenth sternite (?) forming a short, transverse plate with an elongated apodeme. Lateral gonapophyses somewhat reniform in side view, a deep excision between each and the apical margin of the combined ninth and tenth segments. Bursa copulatrix as figured.

Length of fore wing, ♂, 6 mm., ♀, 5-6 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, abdomen in glycerine, paratypes pinned. The fuscous tips of the fore wings make this species easily recognizable.

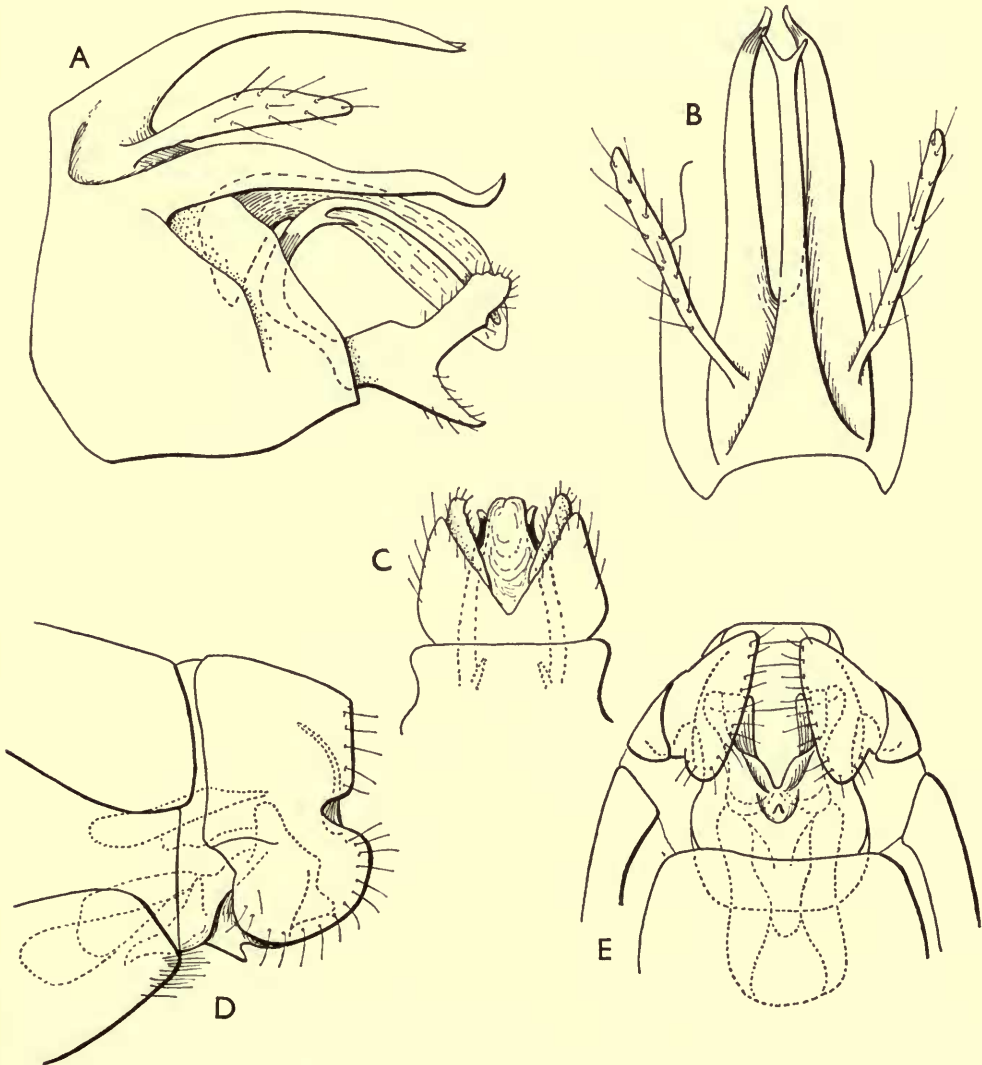


FIG. 67. *Triaenodes ustulata* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth tergites, dorsal; C, ♂, ninth segment, claspers and aedeagus, ventral; D, ♀, lateral; E, ♀, ventral.

Triaenodes sp.

In addition to the specimens of *Triaenodes* described in this paper, Miss Cheesman's collection contains a further eighteen females from Kokoda, two from Mt. Cyclops and one from Mt. Tafa. These cannot be associated with any of the previous species and they are left therefore as *Triaenodes* spp. ♀.

Adicella pulcherrima Ulmer

DUTCH NEW GUINEA: Cyclops Mts., Mt. Lina, 3,500-4,500 ft., iii. 1936, 2 ♂.
Previously recorded from Java and Sumatra.

Setodes niveolineata sp. n.

(Text-figs. 68A, 69)

PAPUA: Kokoda, 1,200 ft., vi-ix. 1933, 6 ♂, 9 ♀.

Head fuscous, with fuscous and broadened, snow-white hairs, the latter forming three longitudinal lines on the vertex, the lateral ones diverging from the antennal bases to the back of the

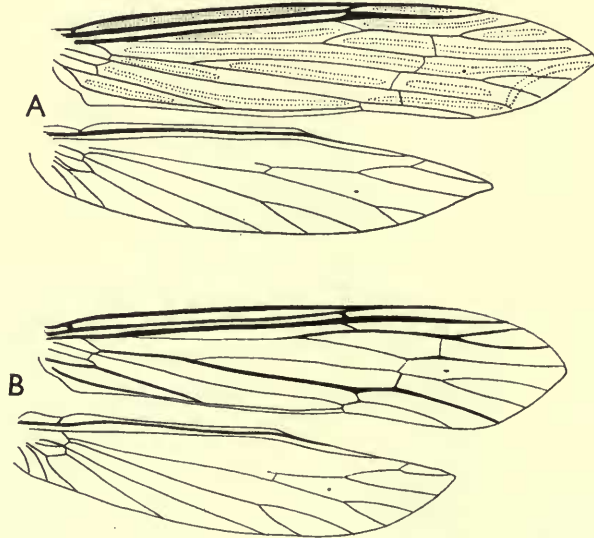


FIG. 68. *Setodes* spp. n. Wings. A, *niveolineata*; B, *papuana*.

head. Antennae snow-white beneath, pale luteous above, with faint fuscous annulations; basal segment with fuscous and whitish pubescence. Palpi with fuscous and greyish pubescence. Thorax fuscous, dorsally with four longitudinal lines of broadened, snow-white hairs, the outer ones being continued, when the wings are closed, by a line of similar hairs in the anal area of the fore wing. Legs fulvous, with fuscous pubescence, anterior femur and tibia with white pubescence externally, anterior tarsus snow-white dorsally, articulations fuscous. Fore wing densely clothed with reddish brown pubescence, most of the cells with narrow, longitudinal streaks of broadened,

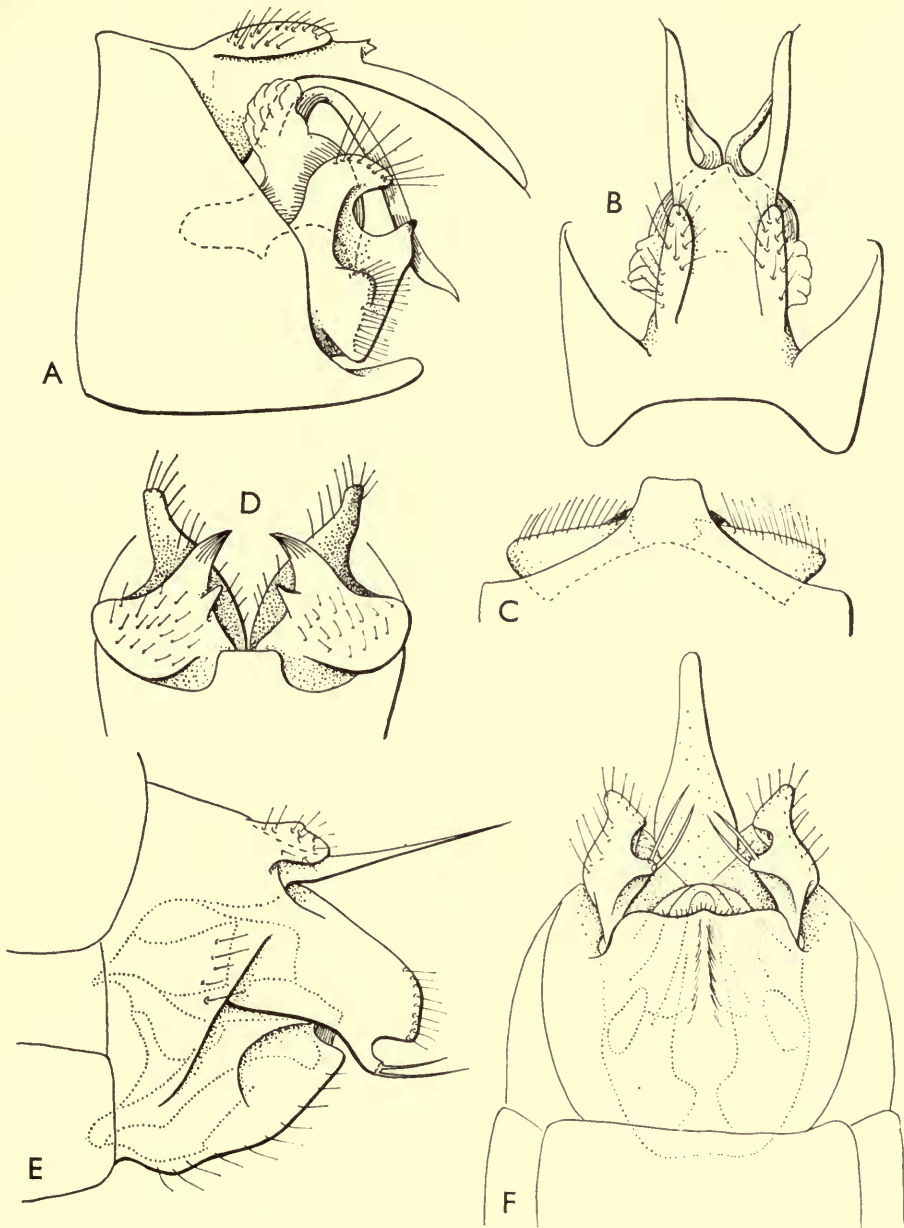


FIG. 69. *Setodes niveolineata* sp. n. Genitalia. A, ♂, lateral; B, ♂, ninth and tenth tergites and parameres, dorsal; C, ♂, ninth sternite and claspers, ventral; D, ♂, the same, from behind; E, ♀, lateral; F, ♀, ventral.

snow-white hairs, the streaks being margined with fuscous pubescence. There is an arched white streak, similarly bordered with fuscous, just behind the apex of the wing. Hind wing only sparsely clothed with fuscous pubescence.

♂ GENITALIA. Ninth segment narrowed dorsally, where it is fused with the tenth. Apical margin of ninth sternite produced at its centre in a narrow, truncate lobe, the apical margin on either side being widely concave. Tenth segment at base about half as wide as ninth segment, forming a hood, whose apical angles are extended downwards as curved spines, which are about as long as the tenth segment. Cerci short, digitate. Aedeagus short and arched in side view, apex acute. From behind, the apex is at first parallel-sided, then tapering to an acute apex. From the upper margin of the aedeagus, about midway, arises a pair of strong, sinuous, spiniform parameres, converging and then diverging in dorsal view. Clasper deep and broad at base, two-branched. In side view, the upper branch is separated from the lower by a short, rounded excision and is directed upwards and then caudad. From behind, it diverges and tapers to a narrow, truncate apex. The lower branch is bluntly triangular in side view and, when viewed from behind, tapers to a strong, acute spur, with a smaller spur about half-way along its inner margin.

♀ GENITALIA. Ninth segment more or less synscleritous, tenth tergite fused with it. The latter forms a long, spatulate lobe, very thin in side view, tapering to a rounded apex in dorsal view. Cerci short, flattened. Lateral gonapophyses about as long as ninth segment, apical margin excised at its lower corner to make a small, digitate process bearing one or two strong, apical setae. Ninth sternite broad, apical margin sinuous. There is a longitudinal, median carina in the apical half of the sternite. Bursa copulatrix strongly sclerotized.

Length of fore wing, ♂, 5·6·2 mm., ♀, 4·7·5·4 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with abdomen cleared and in glycerine, paratypes pinned. The markings of the fore wing somewhat resemble those of the African species, *Hemileptocerus gregarius* Ulmer and *H. hargreavesi* (Ulmer), but both the male and female genitalia follow the pattern of *Setodes unispina* Martynov (India). In the male, there is a similar tenth segment, terminating in two spines, there are two spiniform parameres and the claspers are bilobed, though less complex than in *niveolineata*. In the female, the tenth tergite is also long, and the lateral gonapophyses are similarly formed. Martynov's specimens were in alcohol and no wing pattern was visible.

Setodes papuana sp. n.

(Text-figs. 68B, 70, 71)

PAPUA: Kokoda, 1,200 ft., v-ix. 1933, 19 ♂, 11 ♀.

Head yellowish, with golden pubescence, in unrubbed examples with four narrow, longitudinal bands of broadened, pearly white hairs. Antennae luteous, most of the segments banded apically with fuscous, basal segment unmarked. Palpi yellowish. Thorax yellowish, also with four pearly white lines in unrubbed specimens. Legs yellowish. Fore wing densely clothed with golden yellow pubescence and with rows of small spots formed of pearly white hairs. Hind wing with sparse fuscous pubescence.

♂ GENITALIA. Ninth and tenth tergites fused to form a hood-like dorsal plate. In dorsal view it is broad at its base, tapering to a rounded apex, about half as wide as base, and with a minute median excision. Cerci fused to dorsal surface of tenth segment, appearing as broad, shallow, setiferous warts. Aedeagus narrow and arched, apex somewhat membranous and bearing four minute spines. From its base arise a pair of long, slender, spiniform parameres, arching above the aedeagus and exceeding it in length. Clasper in side view slightly upcurved and tapering towards the apex, which is acute and hooked. Between the claspers, and arising

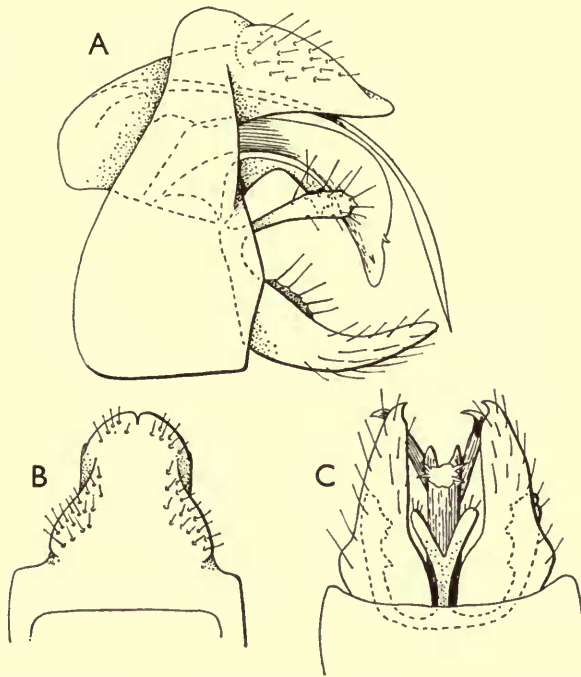


FIG. 70. *Setodes papuana* sp. n. ♂ Genitalia. A, lateral; B, ninth and tenth tergites, dorsal; C, ninth sternite, claspers and aedeagus, ventral.

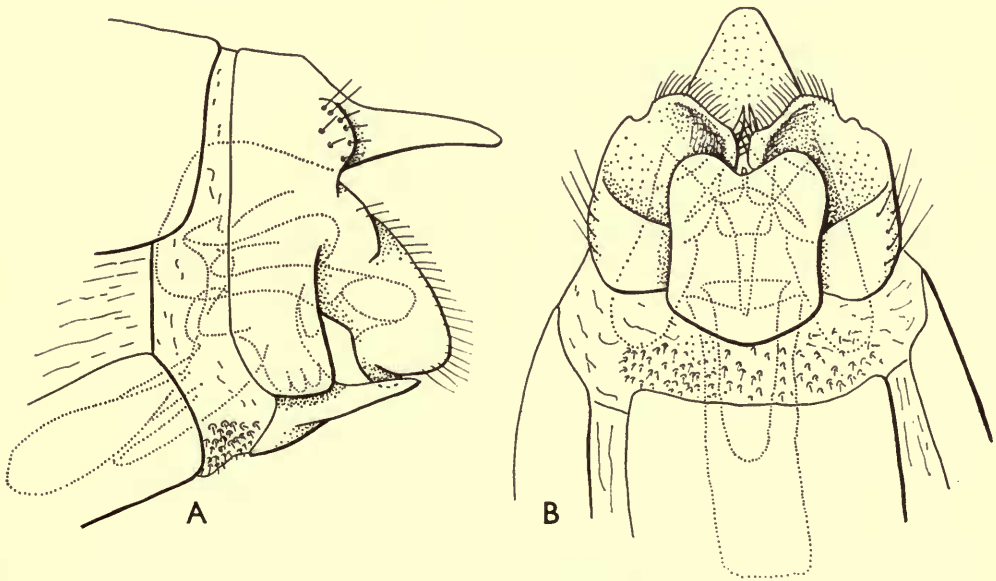


FIG. 71. *Setodes papuana* sp. n. ♀ Genitalia. A, lateral; B, ventral.

from their fused bases is a slender, bifurcate structure, situated beneath the aedeagus, and no doubt representing partly-fused second basal branches.

♀ GENITALIA. Ninth and tenth tergites fused, the tenth projecting in a triangular lobe with rounded apex in ventral view, appearing as a tapering finger in side view. Cerci reduced to short, setiferous warts, one on each side of the tenth segment. Ninth sternite forming a projecting subgenital plate, thin and roughly quadrate in ventral view, apical margin bilobed, basal margin convex. Lateral gonapophyses stout, downcurved, reniform in side view, apices almost meeting ventrally and armed with strong setae. The ventral membrane between the eighth and ninth sternites clothed with numerous setae. Bursa copulatrix complex and obscure.

Length of fore wing, ♂, ♀, 5-6 mm.

♂ HOLOTYPE mounted as microscope preparations, ♀ allotype pinned, with abdomen cleared and in glycerine, paratypes pinned. This species resembles *S. argentifera* McLachlan (India) in the pattern of the fore wings and in the male genitalia. The aedeagus of *papuana* is shorter than the parameres and the claspers have only two basal branches (one pair partly fused basally) instead of three.

Family LEPIDOSTOMATIDAE

Dinarthrospis picea Ulmer

DUTCH NEW GUINEA: Cyclops Mts., Mt. Lina, 3,500-4,500 ft., iii. 1936, 2 ♂.
Previously recorded from Java.

Goerodes japenensis sp. n.

(Text-figs. 72-74)

DUTCH NEW GUINEA: Japen Island, Mt. Eiori, 2,000 ft., ix. 1938, 2 ♂, 7 ♀.

♂. Both males have been affected by moisture and are somewhat bedraggled and the type had a coating of mould. The general coloration is tawny yellow. Spurs 2.4.4. Antennae with a long basal segment, in frontal view with the inner surface convex and densely fringed with long, fine setae. Maxillary palpi probably two-segmented, terminal segment about three times as long as basal, slender, tapering, directed upwards at right angles to the basal segment and heavily shrouded in long, fine, golden setae. Thorax and legs tawny.

Fore wing elongate. The costal margin is folded over at the base, covering the subcosta and radius, the fold gradually narrowing to the apex of the wing and with a long, dense fringe of pale setae. At the bases of the radial sector and media, the membrane is impressed to form a narrow pouch, filled with orange scales, which projects on the under surface of the wing like a semi-ovate purse. Beyond this pouch, the membrane is doubled over on itself to make a long medio-cubital fold or groove, almost reaching to the apical margin. This fold is lined with scale-hairs and the veins anterior to it bear similar broadened hairs. The fold obscures the venation between R_5 and Cu_2 , the area between Cu_2 and the anal fold wide. The cells R_2 and R_4 are about half the length of the fore wing. Hind wing sparsely pubescent, discoidal cell open, R_2 and R_3 fused, cell R_4 present, more than half as long as wing.

♀. The females have also been affected by dampness. The general colour is rather darker than the males. Antenna with a long basal segment, but not unusually heavily fringed. In the fore wing, forks R_2 , R_4 , M_1 and Cu_{1a} present, the first three more than one-third the length of the wing. In the hind wing, forks R_2 , R_4 and Cu_{1a} present, discoidal cell present.

♂ GENITALIA. Ninth segment short. Tenth segment fused to it, obscurely quadrifid, the two inner branches reduced to small, triangular lobes with an excision between them. Outer branches

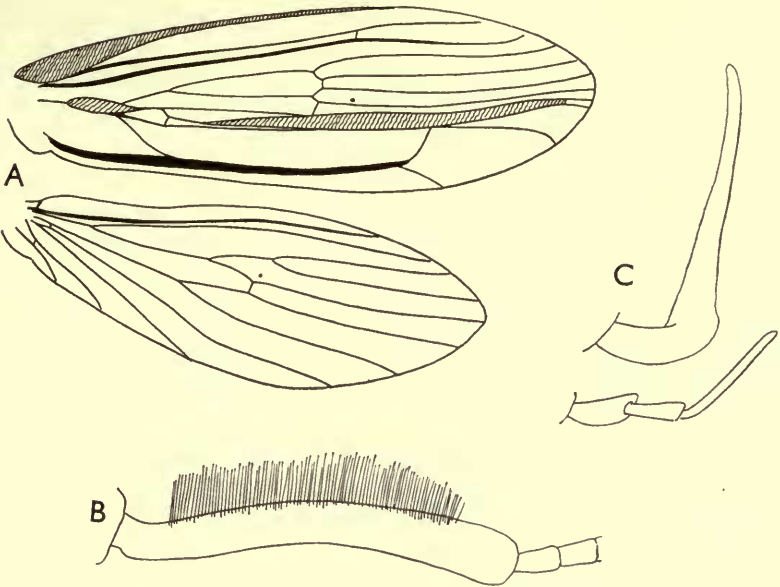


FIG. 72. *Goerodes japonensis* sp. n. ♂. A, wings; B, basal segment of right antenna; C, palpi, lateral.

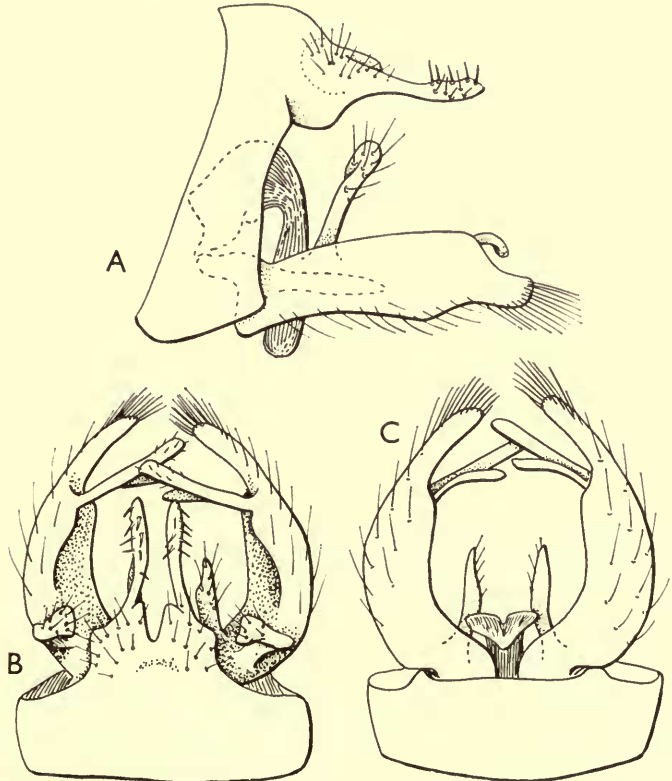


FIG. 73. *Goerodes japonensis* sp. n. ♂ Genitalia. A, lateral; B, dorsal; C, ventral.

long, slender, apices slightly dilated and bearing long setae. Aedeagus strongly arched downwards. Clasper strong, incurved, about four times as long as wide, constricted in its apical third to a finger terminating in a bunch of stout setae. Each clasper carries four branches. There is a slender branch arising from the inner basal margin, directed caudad. At about one-third from the base arises the usual, erect, incurved branch and at the level of the apical constriction are two more branches, slender and incurved, the uppermost the longer.

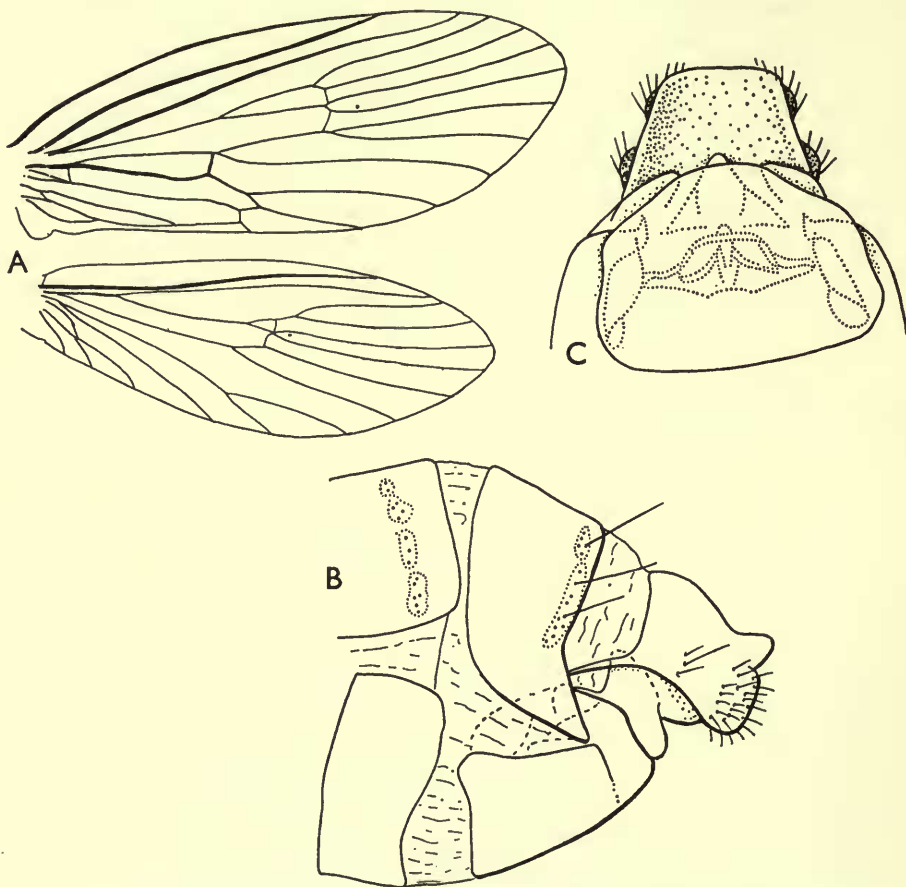


FIG. 74. *Goerodes japonensis* sp. n. ♀. A, wings; B, genitalia, lateral; C, the same, ventral.

♀ GENITALIA. Eighth tergite with lateral angles triangularly produced. Eighth sternite lightly sclerotized, forming a broad subgenital plate with a convex apical margin. Ninth and tenth tergites fused to make a broad hood, apical margin elevated in a pair of rounded projections. Lateral gonapophyses short and deep, rounded. Bursa copulatrix short and rounded.

Length of fore wing, ♂, ♀, 8 mm.

♂ HOLOTYPE, ♀ allotype mounted as microscope preparations, paratypes pinned. The male genitalia of this specimen are quite typical of the genus *Goerodes*, as defined by Mosely. In wing venation, the male differs somewhat from at least the majority

of the described species in the absence of a closed discoidal cell in the hind wing (although this may be an aberration) and in the presence in the fore wing of a distinct fold or groove in the medio-cubital area.

Lepidostomatidae ♀♀

DUTCH NEW GUINEA: Mt. Cyclops, 3,500 ft., iii. 1936, 7 ♀.

These females cannot be associated with *Dinarthropsis picea* Ulmer, since there is a closed discoidal cell in the hind wing.

INDEX TO SPECIES DESCRIBED OR FIGURED

- | | |
|------------------------------------|--------------------------------------|
| aberrans, Tinodes, 132 | mondoana, Triaenodes, 173 |
| acuminata, Oecetis, 161 | moselyi, Hydropsyche, 135 |
| arctipennis, Oecetis, 156 | moselyi, Polycentropus, 125 |
| asymmetrica, Oecetis, 165 | nigrolineata, Triaenodes, 171 |
| aurea, Triaenodes, 177 | niveolineata, Setodes, 188 |
| auricollis, Polycentropus, 127 | obscura, Orthotrichia, 103 |
| bispina, Hydroptila, 106 | orakaivai, Herbertorossia, 141 |
| cheesmanae, Chimarra, 115 | ornata, Oecetis, 157 |
| cheesmanae, Hydropsychodes, 142 | papuana, Chimarra, 110 |
| cheesmanae, Leptocerus, 152 | papuana, Percivalia, 100 |
| corallina, Triaenodes, 175 | papuana, Setodes, 182 |
| costalis, Triaenodes, 168 | piceus, Polycentropus, 128 |
| cyclopica, Chimarra, 108 | productus, Synagapetus, 102 |
| cyclopicus, Ecnomus, 134 | rosselinus Navás, Polycentropus, 130 |
| excavata, Herbertorossia, 137 | sabrona, Chimarra, 113 |
| falcata, Chimarra, 117 | sabronensis, Herbertorossia, 137 |
| gilolensis McL., Notanatomica, 150 | schmidi, Chimarra, 111 |
| grandis, Polycentropus, 121 | similis, Polycentropus, 130 |
| io, Anisocentropus, 146 | sinuosa, Chimarra, 118 |
| japenensis, Goerodes, 184 | sinuosus, Polycentropus, 124 |
| kokodana, Chimarra, 119 | squamosa, Oecetis, 154 |
| kokodana, Orthotrichia, 104 | striata, Herbertorossia, 139 |
| longispina, Triaenodes, 168 | subfusca, Abacaria, 143 |
| longiterga, Oecetis, 161 | tafana, Triaenodes, 172 |
| mafulua, Diplectrona, 145 | ulmeri, Chimarra, 114 |
| mambia, Oecetis, 157 | ustulata, Triaenodes, 177 |
| marginata, Oecetis, 163 | |

